

=> FILE REG

FILE 'REGISTRY' ENTERED AT 13:57:00 ON 25 JUL 2007

USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.

PLEASE SEE "HELP USAGETERMS" FOR DETAILS.

COPYRIGHT (C) 2007 American Chemical Society (ACS)

=> D HIS

FILE 'HCAPLUS' ENTERED AT 13:40:48 ON 25 JUL 2007

L1 39730 S HASEGAWA ?/AU

L2 12253 S IZUMI ?/AU

L3 1606 S SHIOHARA ?/AU

L4 13097 S SUGAWARA ?/AU

L5 9305 S HIRAYAMA ?/AU

L6 3770 S OBA ?/AU

L7 643 S IKUHARA ?/AU

L8 6 S L1 AND L2 AND L3 AND L4 AND L5 AND L6 AND L7
SEL L8 2 RN

FILE 'REGISTRY' ENTERED AT 13:42:00 ON 25 JUL 2007

L9 3 S E1-E3

SEL L9 2 RN

L10 1 S E4

FILE 'HCA' ENTERED AT 13:43:05 ON 25 JUL 2007

L11 1935 S L10 OR BAZRO3 OR ZRBAO3

FILE 'REGISTRY' ENTERED AT 13:43:11 ON 25 JUL 2007

L12 24315 S (BA (L) CU (L) O)/ELS

L13 12248 S L12 AND LNTH/PG

L14 2940 S L13 AND 4/ELC.SUB

L15 856 S L13 AND SM/ELS

L16 208 S L15 AND L14

FILE 'HCA' ENTERED AT 13:47:04 ON 25 JUL 2007

L17 1342 S L16

L18 9416 S L14

L19 273769 S SINGLE?(2A)CRYST?

L20 295849 S THINFILM? OR THIN?(2A)FILM?

L21 195027 S SUPERCOND? OR SUPER(2A)(COND# OR CONDUCT?)

L22 20 S L11 AND L17

L23 17 S L22 AND (L19 OR L20 OR L21)

L24 70 S L11 AND L18

L25 15 S L24 AND L19
L26 5 S L24 AND L20
L27 60 S L24 AND L21
L28 15 S (L25 OR L26) AND L27
L29 20 S L22 OR L23
L30 12 S L28 NOT L29
L31 16 S 1840-2002/PY,PRY AND L29
L32 8 S 1840-2002/PY,PRY AND L30

=> FILE HCA

FILE 'HCA' ENTERED AT 13:57:04 ON 25 JUL 2007

USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.

PLEASE SEE "HELP USAGETERMS" FOR DETAILS.

COPYRIGHT (C) 2007 AMERICAN CHEMICAL SOCIETY (ACS)

=> D L31 1-16 BIB ABS HITSTR HITIND

L31 ANSWER 1 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 140:397587 HCA Full-text

TI **Single crystal thin film**

IN Hasegawa, Katsuya; Izumi, Teruo; Shiohara, Yuh; Sugawara, Yoshihiro;
Hirayama, Tsukasa; Oba, Fumiyasu; Ikuhara, Yuichi

PA Sumitomo Electric Industries, Ltd., Japan; International
Superconductivity Technology Center, the Juridical Foundation

SO PCT Int. Appl., 31 pp.

CODEN: PIXXD2

DT Patent

LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
------------	------	------	-----------------	------

-----	----	-----	-----	
-------	------	-------	-------	--

PI	WO 2004040047	A1	20040513	WO 2003-JP13888
----	---------------	----	----------	-----------------

200310

29

<--

W: CN, KR, US

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,

IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR

JP 2004149380	A	20040527	JP 2002-318523
---------------	---	----------	----------------

200210

31

EP 1557486 A1 20050727 EP 2003-769995
200310
29

<--

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU,
SK

CN 1708607 A 20051214 CN 2003-80102130
200310
29

<--

US 2006009362 A1 20060112 US 2005-526896
200503
07

<--

PRAI JP 2002-318523 A 20021031 <--
WO 2003-JP13888 W 20031029

AB Formation of a **single crystal thin film** of enhanced quality on an underlayer is described, which is effectively applicable to prodn. of an oxide high-temp. **superconductor thin film** being usable in, e.g., **superconductive** wire materials and **superconductive** devices. In particular, a **single crystal thin film** formed on a substrate, the **thin film** constituted of a substance different from that of the substrate, is characterized in that a specified at. layer contained in common in the substrate and the **thin film** is shared at an interface of the substrate and the **thin film**, and that in a region as adjacent to the interface as 100 or fewer unit lattices of the **thin film** apart from the interface, the ratio of crystals having grown with an orientation of ± 2 degrees or less deviation angle on the basis of the crystal orientation of the substrate is $\geq 50\%$.

IT **111419-82-0**, Barium copper samarium oxide
(formation of **single crystal thin film** via middle layer)

RN **111419-82-0** HCA

CN Barium copper samarium oxide (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	x	17778-80-2
Cu	x	7440-50-8
Ba	x	7440-39-3
Sm	x	7440-19-9

IT **12009-21-1**, Barium zirconate (**BaZrO₃**)
(formation of **single crystal thin film** via middle layer)

RN **12009-21-1** HCA

CN Barium zirconium oxide (**BaZrO₃**) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

IC ICM C30B029-22

ICS H01L039-24

CC 75-1 (Crystallography and Liquid Crystals)

Section cross-reference(s): 76

ST oxide **superconductor** film wire **superconducting**
device epitaxy

IT Epitaxy

Superconducting films

Superconducting wires

Superconductor devices

(formation of **single crystal thin**
film via middle layer)

IT **Superconductors**

(oxide; formation of **single crystal**
thin film via middle layer)

IT **111419-82-0**, Barium copper samarium oxide

(formation of **single crystal thin**
film via middle layer)

IT 1309-48-4, Magnesia, uses **12009-21-1**, Barium zirconate (
BaZrO3)

(formation of **single crystal thin**
film via middle layer)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L31 ANSWER 2 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 138:63988 HCA Full-text

TI Influence of the second buffer layer for alignment of seed film on
Ni tape with NiO buffer layer

AU Kai, M.; Izumi, T.; Hasegawa, K.; Tokunaga, Y.; Asada, S.; Nakamura,
Y.; Izumi, T.; Watanabe, T.; Shiohara, Y.

CS ISTE, Superconductivity Research Laboratory, Koto-ku, Tokyo,
135-0062, Japan.

SO Physica C: Superconductivity and Its Applications (Amsterdam,
Netherlands) (**2002**), 378-381(Pt. 2), 998-1002

CODEN: PHYCE6; ISSN: 0921-4534

PB Elsevier Science B.V.

DT Journal

LA English

AB To investigate the influence of the buffer layer for the seed film quality which is important to obtain high quality liq. phase epitaxy film, we prepd. several different kinds of SmBa₂Cu₃O_y (Sm123) seed films on SOE-NiO buffered biaxially textured Ni tapes with and without the 2nd buffer layer of **BaZrO₃** by the pulsed laser deposition method. As a consequence of the investigation, it was found that **BaZrO₃** is a suitable material as a buffer layer to obtain highly in-plane aligned Sm123 seed films on SOE-NiO buffered biaxially textured Ni tapes.

IT 12009-21-1, Barium zirconium oxide (**BaZrO₃**)
(**BaZrO₃** 2nd buffer layer effect for alignment of SmBa₂Cu₃O_y seed film on Ni tape with NiO buffer layer by pulsed laser deposition)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO₃) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

IT 110778-98-8D, Barium copper samarium oxide (Ba₂Cu₃SmO₇),
oxygen-nonstoichiometric
(**BaZrO₃** 2nd buffer layer effect for alignment of SmBa₂Cu₃O_y seed film on Ni tape with NiO buffer layer by pulsed laser deposition)

RN 110778-98-8 HCA

CN Barium copper samarium oxide (Ba₂Cu₃SmO₇) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O	7	17778-80-2
Cu	3	7440-50-8
Ba	2	7440-39-3
Sm	1	7440-19-9

CC 75-1 (Crystallography and Liquid Crystals)

Section cross-reference(s): 76

IT Crystallinity
(**BaZrO₃** 2nd buffer layer effect for alignment of SmBa₂Cu₃O_y seed film on Ni tape with NiO buffer layer by pulsed laser deposition)

IT Vapor deposition process
(laser ablation; **BaZrO₃** 2nd buffer layer effect for alignment of SmBa₂Cu₃O_y seed film on Ni tape with NiO buffer layer by pulsed laser deposition)

IT 1313-99-1, Nickelous oxide, uses 7440-02-0, Nickel, uses
12009-21-1, Barium zirconium oxide (**BaZrO3**)
(**BaZrO3** 2nd buffer layer effect for alignment of
SmBa2Cu3Oy seed film on Ni tape with NiO buffer layer by pulsed
laser deposition)

IT 110778-98-8D, Barium copper samarium oxide (Ba2Cu3SmO7),
oxygen-nonstoichiometric
(**BaZrO3** 2nd buffer layer effect for alignment of
SmBa2Cu3Oy seed film on Ni tape with NiO buffer layer by pulsed
laser deposition)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L31 ANSWER 3 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 137:209097 HCA Full-text

TI LPE growth of RE123 on a metal substrate

AU Izumi, Toru; Yao, Xin; Kai, Masahiko; Hasegawa, Katsuya; Tokunaga,
Yoshitaka; Asada, Shigenobu; Nakamura, Yuichi; Izumi, Teruo;
Watanabe, Tomonori; Shiohara, Yuh

CS Superconductivity Res. Lab., Tokyo, 135-0062, Japan

SO Nippon Kinzoku Gakkaishi (2002), 66(4), 329-333

CODEN: NIKGAV; ISSN: 0021-4876

PB Nippon Kinzoku Gakkai

DT Journal

LA Japanese

AB RE123 **superconductive** oxides are expected to be used for elec. conductors due to its high
superconducting performance at 77 K. The LPE process has an advantage to fabricate a thick
superconducting layer at a high growth rate with high **superconducting** properties for realizing high
Jc conductors. The authors tried two structures to fabricate in-plane aligned Y123 layer on textured Ni
substrates with SOE-NiO. One was a double layered LPE structure and the other was a nonreactive
buffered structure using a **BaZrO3** buffer layer. The in-plane aligned Y123 LPE layer was
successfully grown on an NiO/Ni textured substrate for each structure and the Tc value of 90 K was
achieved in the nonreactive buffered structure. The in-plane alignment of the seed layer is a crucial
factor for the double LPE process since the partial dissoln. of worse aligned seed crystals caused
formation of noncoverage regions on the surface of the NiO buffer layer, where the NiO buffer layer
would react with the soln. during the 2nd LPE processing.

IT 12009-21-1, Barium zirconate (**BaZrO3**)
(LPE growth of barium rare earth cuprate on buffered metal
substrates)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO3) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	3	17778-80-2

Zr		1		7440-67-7
Ba		1		7440-39-3

IT 111419-82-0, Barium copper samarium oxide
(LPE growth of barium rare earth cuprate on buffered metal substrates)

RN 111419-82-0 HCA

CN Barium copper samarium oxide (CA INDEX NAME)

Component		Ratio		Component
				Registry Number
=====+=====+=====				
O		x		17778-80-2
Cu		x		7440-50-8
Ba		x		7440-39-3
Sm		x		7440-19-9

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 75

ST LPE lanthanide barium cuprate **superconductor** nickel oxide
buffer nickel

IT **Superconducting** films
(LPE growth of RE123 on metal substrate)

IT **Superconductors**
(cuprate; LPE growth of barium rare earth cuprate on buffered metal substrates)

IT 1309-48-4, Magnesium oxide (MgO), processes 1313-99-1, Nickel oxide (NiO), processes 7440-02-0, Nickel, processes

12009-21-1, Barium zirconate (**BaZrO3**)
(LPE growth of barium rare earth cuprate on buffered metal substrates)

IT 111419-82-0, Barium copper samarium oxide
(LPE growth of barium rare earth cuprate on buffered metal substrates)

L31 ANSWER 4 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 137:209096 HCA Full-text

TI Preparation of SmBa2Cu3Oy films with improved in-plane alignment by pulsed laser deposition

AU Hasegawa, Katsuya; Hobara, Natsuro; Nakamura, Yuichi; Izumi, Teruo; Shiohara, Yuh

CS Superconductivity Res. Lab., International Superconductivity Technology Center, Tokyo, 135-0062, Japan

SO Nippon Kinzoku Gakkaishi (2002), 66(4), 320-328
CODEN: NIKGAV; ISSN: 0021-4876

PB Nippon Kinzoku Gakkai

DT Journal
LA Japanese

AB Prepn. of SmBa₂Cu₃O_y (Sm123) and BaZrO₃ (BZO) films by pulsed laser deposition was studied using MgO **single cryst.** substrates. Highly c-axis oriented Sm123 films with a 4-fold symmetry were successfully deposited on MgO **single crystals**, which had a T_c onset of 93 K and a zero resistance of 89 K. The BZO buffer improved in-plane alignment of the Sm123 film. In addn., highly textured BZO and Sm123 films were realized on in-plane aligned MgO films grown by inclined substrate deposition. The FWHMs (full width at half max.)s of in-plane and out-of-plane alignment for the textured Sm123 in the combination were reached at 10.5° and 4.0°, resp. The reason that the BZO was effective on the epitaxial growth of Sm123 films can not be explained only by the idea of a simple lattice match, since the lattice const. of BZO is close to that of MgO. The effect of the BZO buffer is discussed in view of the interface energy based on crystallog. consideration. A chem. bonding at the interface is important for interface energy as well as the lattice match. Further, the conception of the interface energy on hetero-epitaxial growth was applied for the c/a-axes orientation behavior of RE123.

IT **12009-21-1**, Barium zirconate (BaZrO₃)
(laser epitaxy of barium samarium cuprate **superconducting**
films on barium zirconated buffered magnesia substrate under
oxygen pressure)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO₃) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

IT **111419-82-0**, Barium copper samarium oxide
(laser epitaxy of barium samarium cuprate **superconducting**
films on barium zirconated buffered magnesia substrate under
oxygen pressure)

RN 111419-82-0 HCA

CN Barium copper samarium oxide (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	x	17778-80-2
Cu	x	7440-50-8
Ba	x	7440-39-3
Sm	x	7440-19-9

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 75

ST laser epitaxy barium samarium cuprate **superconducting** film

zirconate buffer

IT Bond

(interfacial; laser epitaxy of barium samarium cuprate **superconducting** films on barium zirconated buffered magnesia substrate under oxygen pressure)

IT Interfacial energy

Laser epitaxy

Partial pressure

Superconducting films

(laser epitaxy of barium samarium cuprate **superconducting** films on barium zirconated buffered magnesia substrate under oxygen pressure)

IT Crystal structure

Electric resistance

Superconducting critical temperature

(of barium samarium cuprate on magnesia substrate)

IT 7782-44-7, Oxygen, uses

(laser epitaxy of barium samarium cuprate **superconducting** films on barium zirconated buffered magnesia substrate under oxygen pressure)

IT 12009-21-1, Barium zirconate (**BaZrO₃**)

(laser epitaxy of barium samarium cuprate **superconducting** films on barium zirconated buffered magnesia substrate under oxygen pressure)

IT 1309-48-4, Magnesium oxide (MgO), processes

(laser epitaxy of barium samarium cuprate **superconducting** films on barium zirconated buffered magnesia substrate under oxygen pressure)

IT 111419-82-0, Barium copper samarium oxide

(laser epitaxy of barium samarium cuprate **superconducting** films on barium zirconated buffered magnesia substrate under oxygen pressure)

L31 ANSWER 5 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 137:173368 HCA [Full-text](#)

TI Fabrication of RE123 layer for coated conductor by double LPE process

AU Nakamura, Yuichi; Hobara, Natsuro; Izumi, Toru; Kai, Masahiko; Hasegawa, Katsuya; Xin, Yao; Asada, Shigenobu; Watanabe, Tomonori; Izumi, Teruo; Shiohara, Yuh

CS Superconductivity Research Laboratory, Koto-ku, Tokyo, 135-0062, Japan

SO AIP Conference Proceedings (2002), 614(Advances in Cryogenic Engineering), 659-666

CODEN: APCPCS; ISSN: 0094-243X

PB American Institute of Physics

DT Journal

LA English

AB RE123 **superconductive** oxides are expected to be utilized for elec. conductors due to its **superconducting** performance better than Bi-system **superconductors** at 77 K. The liq. phase epitaxy (LPE) process has the advantage of fabricating a thick **superconducting** layer at a high growth rate maintaining high J_c values in comparison with commonly used vapor deposition processes. We tried to fabricate the double layered LPE process for realizing an in-plane aligned RE123 layer on a textured Ni substrate with a NiO buffer layer. The in-plane aligned double layered LPE structure was successfully grown on NiO/Ni textured substrates and showed a T_c value of 88 K. The in-plane alignment of the seed layer was found to be a crucial factor for the double LPE process because the partial dissoln. of badly aligned seed crystals caused formation of non-coverage regions on the surface of the NiO buffer layer, where the NiO buffer layer would react with the soln. during the second LPE processing. The in-plane aligned Sm123-Ni LPE layer was successfully grown on 10 cm long NiO/Ni textured substrates using the LPE app. by moving a metal tape laterally on the surface of the soln. A growth rate higher than 1 $\mu\text{m}/\text{min}$ was attained. Addnl., a non-reactive buffered structure using **BaZrO3** suitable for the LPE process was proposed.

IT 110778-98-8D, Barium copper samarium oxide $\text{Ba}_2\text{Cu}_3\text{SmO}_7$,
oxygen-deficient

(**superconducting** coating; coated conductor of samarium
cuprate layer on Ni substrate/NiO buffer prepd. by double liq.
phase epitaxy process)

RN 110778-98-8 HCA

CN Barium copper samarium oxide ($\text{Ba}_2\text{Cu}_3\text{SmO}_7$) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
=====+=====+=====		
O	7	17778-80-2
Cu	3	7440-50-8
Ba	2	7440-39-3
Sm	1	7440-19-9

CC 57-2 (Ceramics)

Section cross-reference(s): 76

ST rare earth cuprate layer coating liq phase epitaxy; samarium cuprate
superconducting layer coating liq phase epitaxy; nickel
oxide liq phase epitaxy samarium cuprate **superconductor**
coating

IT **Superconductors**

(ceramic, samarium cuprate; coated conductor of samarium cuprate
layer on Ni substrate/NiO buffer prepd. by double liq. phase
epitaxy process)

IT Liquid phase epitaxy

Orientational order

Superconducting critical temperature

Superconducting tapes

(coated conductor of samarium cuprate layer on Ni substrate/NiO buffer prepd. by double liq. phase epitaxy process)

IT Ceramics

(**superconductors**, samarium cuprate; coated conductor of samarium cuprate layer on Ni substrate/NiO buffer prepd. by double liq. phase epitaxy process)

IT **110778-98-8D**, Barium copper samarium oxide $\text{Ba}_2\text{Cu}_3\text{SmO}_7$, oxygen-deficient

(**superconducting** coating; coated conductor of samarium cuprate layer on Ni substrate/NiO buffer prepd. by double liq. phase epitaxy process)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L31 ANSWER 6 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 132:297453 HCA [Full-text](#)

TI Procedure for the production of melt textured volume samples on the basis of high temperature **superconductor** $\text{Nd}_1\text{Ba}_2\text{Cu}_3\text{O}_7/\text{Nd}_4\text{Ba}_2\text{Cu}_2\text{O}_{10}$ (NdBC).

IN Kaiser, Axel; Bornemann, Hans

PA Forschungszentrum Karlsruhe GmbH, Germany

SO Ger. Offen., 6 pp.

CODEN: GWXXBX

DT Patent

LA German

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
------------	------	------	-----------------	------

-----	---	-----	-----	
-------	-----	-------	-------	--

-------	--	--	--	--

PI DE 19841664	A1	20000420	DE 1998-19841664	
			199809	
			11	

<--

PRAI DE 1998-19841664 19980911 <--

AB A procedure for the prodn. of bulk $\text{Nd}_1\text{Ba}_2\text{Cu}_3\text{O}_7/\text{Nd}_4\text{Ba}_2\text{Cu}_2\text{O}_{10}$ (NdBC) high-temp. **superconductor** is described. The compn. and the raw materials are optimized in order to achieve the requirements, e.g. the increase of the levitation capability or applications in the magnetic field. A powder mixt. of raw materials is ground in a mill to a uniform mixt. until 0.18 wt.% CO_2 is absorbed and the particle size equilibrates. Binders used for shaping the powder mixt. are such as Shellac, PMMA, wax, thermoplastics, or polymers such as polyvinyl butyral, or polyvinyl alc., and their derivs., or polyacrylate or polymethacrylate deriv. The green mass is heat treated in air, each sample being top-seeded with oriented seed crystals, and heat treated in air to seal and texture them. The samples achieve the T_c and J_c **supercond**. properties required, with at least one more heat treatment in Ar, Ar-O, or air atm. for 6-24 h at 800-1030°C. The green mass is heat treated to the sintering temp. where the binder burn-out occurs. The samples may contain 50 Nd-123, 5-50 Nd-422, and/or 0-45 Y-211, and/or 0-45 Sm-211. The compn. is made from one or more of $\text{Nd}_{0.8-1.8}\text{Ba}_2\text{-yCu}_3\text{-zO}_{7-x}$, where $x = 0-0.5$, $y = -$

0.2-0.2, z = -0.3-0.3, Nd₂O₃ 0-15, Nd₄Ba₂Cu₂O₁₀ 0-50, Y-123 0-20, Sm-123 0-20, Y-211 0-45, Sm-211 0-45, Nd-422 0-45 wt.%, a reaction mixt. of Nd-422, BaCuO_x, and CuO or an oxide/carbonate mixt. of Nd₂O₃, BaO, BaCO₃ and CuO or a mixt. of Ba/Cu from BaCO₃/BaO and CuO and Nd₂O₃. Compns. may also be made with one or more of (3 mol% BaCuO + 2 mol% CuO) 0-10, silver oxide 0-6, Pt or PtO₂ 0.1-1, Ce or CeO₂ 0.1-2, Rh or Rh₂O₃ 0.005-1, Yb₂O₃ 0-2, uranium or uranium oxide (238U or 238U + 235U or natural U) 0-2. The compns. may also contain 0-2 wt.% of one or more of BaO, CuO, CaO₂, MgO, Al₂O₃ or **BaZrO₃** (or BaO + ZrO₂) 0-15 wt.%, and 0-1 wt.% of one or more of ZrO₂, V₂O₅, TiO₂, Nb₂O₅, Sb₂O₃, Bi₂O₃. The method involves handling in air, thus simplifying the process, in particular application of the seed crystals and in the use of a simple furnace.

IT 12009-21-1, Barium zirconate (**BaZrO₃**)

110778-98-8, Barium copper samarium oxide (Ba₂Cu₃SmO₇)

(raw material; procedure for prodn. of melt textured vol. samples on basis of high temp. **superconductor**

Nd₁Ba₂Cu₃O₇/Nd₄Ba₂Cu₂O₁₀ (NdBC))

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO₃) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

RN 110778-98-8 HCA

CN Barium copper samarium oxide (Ba₂Cu₃SmO₇) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	7	17778-80-2
Cu	3	7440-50-8
Ba	2	7440-39-3
Sm	1	7440-19-9

IC ICM C04B035-50

ICS C04B035-45

CC 57-2 (Ceramics)

Section cross-reference(s): 76

ST barium neodymium cuprate **superconductor** compn

optimization; melt texturing barium neodymium cuprate

superconductor compn optimization

IT Polymers, uses

Polyvinyl butyrals

Shellac

Waxes

(binder; procedure for prodn. of melt textured vol. samples on basis of high temp. **superconductor**

Nd1Ba2Cu3O7/Nd4Ba2Cu2O10 (NdBC))

IT **Superconductors**

Superconductors

(ceramic, barium neodymium cuprate-based; procedure for prodn. of melt textured vol. samples on basis of high temp.

superconductor Nd1Ba2Cu3O7/Nd4Ba2Cu2O10 (NdBC))

IT **Air**

(heat treating atm.; procedure for prodn. of melt textured vol. samples on basis of high temp. **superconductor**

Nd1Ba2Cu3O7/Nd4Ba2Cu2O10 (NdBC))

IT **Composition**

Controlled atmospheres

Raw materials

(procedure for prodn. of melt textured vol. samples on basis of high temp. **superconductor** Nd1Ba2Cu3O7/Nd4Ba2Cu2O10 (NdBC))

IT **Ceramics**

Ceramics

(**superconductors**, barium neodymium cuprate-based; procedure for prodn. of melt textured vol. samples on basis of high temp. **superconductor** Nd1Ba2Cu3O7/Nd4Ba2Cu2O10 (NdBC))

IT **Plastics, uses**

(thermoplastics, binder; procedure for prodn. of melt textured vol. samples on basis of high temp. **superconductor** Nd1Ba2Cu3O7/Nd4Ba2Cu2O10 (NdBC))

IT 124-38-9, Carbon dioxide, processes

(absorption of; procedure for prodn. of melt textured vol. samples on basis of high temp. **superconductor** Nd1Ba2Cu3O7/Nd4Ba2Cu2O10 (NdBC))

IT 79-10-7D, Acrylic acid, polymers, derivs. 79-41-4D, Methacrylic acid, polymers, derivs. 9002-89-5, Polyvinyl alcohol 9011-14-7, PMMA

(binder; procedure for prodn. of melt textured vol. samples on basis of high temp. **superconductor** Nd1Ba2Cu3O7/Nd4Ba2Cu2O10 (NdBC))

IT 7440-37-1, Argon, processes 7782-44-7, Oxygen, processes

(heat treating atm.; procedure for prodn. of melt textured vol. samples on basis of high temp. **superconductor** Nd1Ba2Cu3O7/Nd4Ba2Cu2O10 (NdBC))

IT 513-77-9, Barium carbonate (BaCO3) 1304-28-5, Barium oxide (BaO), processes 1304-76-3, Bismuth oxide (Bi2O3), processes 1306-38-3, Cerium oxide (CeO2), processes 1309-48-4, Magnesium oxide (MgO), processes 1309-64-4, Antimony oxide (Sb2O3), processes

1313-97-9, Neodymium oxide (Nd₂O₃) 1314-15-4, Platinum oxide (PtO₂) 1314-23-4, Zirconium oxide (ZrO₂), processes 1314-37-0, Ytterbium oxide (Yb₂O₃) 1314-62-1, Vanadium oxide (V₂O₅), processes 1317-38-0, Cupric oxide, processes 1344-28-1, Alumina, processes 7440-06-4, Platinum, processes 7440-16-6, Rhodium, processes 7440-45-1, Cerium, processes 7440-61-1, Uranium, processes 11113-93-2, Uranium oxide **12009-21-1**, Barium zirconate (**BaZrO₃**) 12036-35-0, Rhodium oxide (Rh₂O₃) 13463-67-7, Titanium oxide (TiO₂), processes 20667-12-3, Silver oxide 57348-59-1, Barium copper oxide 109064-29-1, Barium copper yttrium oxide (Ba₂Cu₃YO₇) **110778-98-8**, Barium copper samarium oxide (Ba₂Cu₃SmO₇) 158039-01-1, Calcium oxide (CaO₂) 262358-78-1, Barium copper neodymium oxide (Ba_{1.8}-2.2Cu_{2.7}-3.3Nd_{0.8}-1.8O_{6.5}-7)

(raw material; procedure for prodn. of melt textured vol. samples

on basis of high temp. **superconductor**

Nd₁Ba₂Cu₃O₇/Nd₄Ba₂Cu₂O₁₀ (NdBC))

IT 90804-74-3, Barium copper neodymium oxide (BaCuNd₂O₅) 111591-04-9,

Barium copper neodymium oxide (Ba₂Cu₃NdO₇)

(**superconductors**; procedure for prodn. of melt textured

vol. samples on basis of high temp. **superconductor**

Nd₁Ba₂Cu₃O₇/Nd₄Ba₂Cu₂O₁₀ (NdBC))

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L31 ANSWER 7 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 132:259335 HCA Full-text

TI Procedure for the production of optimized, melt-textured bulk

samples based on high-temperature **superconductors** of

composition (Sm/Nd)Ba₂Cu₃O₇

IN Kaiser, Axel; Bornemann, Hans

PA Forschungszentrum Karlsruhe G.m.b.H., Germany

SO Ger. Offen., 6 pp.

CODEN: GWXXBX

DT Patent

LA German

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
------------	------	------	-----------------	------

-----	----	-----	-----	
-------	------	-------	-------	--

-------	--	--	--	--

PI DE 19841574	A1	20000330	DE 1998-19841574	
----------------	----	----------	------------------	--

			199809	
--	--	--	--------	--

			11	
--	--	--	----	--

<--

PRAI DE 1998-19841574		19980911	<--	
-----------------------	--	----------	-----	--

AB A procedure is described for the prodn. and shaping of the title **superconductors** with the compn. and the raw materials varied to achieve optimum compns. for applications such as magnetic levitation. Further the process duration can be kept very short and the handling simplified by applying the seed crystal before the heat treatment and using lower processing temps.

IT **12009-21-1**, Barium zirconium oxide (**BaZrO₃**)
(optimized, melt-textured bulk samples based on high-temp.
superconductors of compn. (Sm/Nd)Ba₂Cu₃O₇)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO₃) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

IT **262358-77-0**, Barium copper samarium oxide
(Ba_{1.8-2.2}Cu_{2.7-3.3}Sm_{0.8-1.8}O_{6.5-7})
(optimized, melt-textured bulk samples based on high-temp.
superconductors of compn. (Sm/Nd)Ba₂Cu₃O₇)

RN 262358-77-0 HCA

CN Barium copper samarium oxide (Ba_{1.8-2.2}Cu_{2.7-3.3}Sm_{0.8-1.8}O_{6.5-7})
(9CI) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	6.5 - 7	17778-80-2
Cu	2.7 - 3.3	7440-50-8
Ba	1.8 - 2.2	7440-39-3
Sm	0.8 - 1.8	7440-19-9

IT **82642-05-5**, Barium copper samarium oxide (BaCuSm₂O₅)
(optimized, melt-textured bulk samples based on high-temp.
superconductors of compn. (Sm/Nd)Ba₂Cu₃O₇)

RN 82642-05-5 HCA

CN Barium copper samarium oxide (BaCuSm₂O₅) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	5	17778-80-2
Cu	1	7440-50-8
Ba	1	7440-39-3
Sm	2	7440-19-9

IC ICM C04B035-45
 ICS C04B035-505
 CC 76-4 (Electric Phenomena)
 Section cross-reference(s): 57, 75, 77
 ST barium neodymium samarium cuprate **superconductor** melt
 processing; magnetic levitation cuprate **superconductor**
 IT Acrylic polymers, uses
 Polyvinyl butyrals
 (binder; optimized, melt-textured bulk samples based on
 high-temp. **superconductors** of compn. (Sm/Nd)Ba₂Cu₃O₇)
 IT Sintering
 (hot pressing; optimized, melt-textured bulk samples based on
 high-temp. **superconductors** of compn. (Sm/Nd)Ba₂Cu₃O₇)
 IT Binders
 Crystallization
 Heat treatment
 Sintering
 (optimized, melt-textured bulk samples based on high-temp.
superconductors of compn. (Sm/Nd)Ba₂Cu₃O₇)
 IT Magnetic levitation
Superconducting magnets
 (optimized, melt-textured bulk samples based on high-temp.
superconductors of compn. (Sm/Nd)Ba₂Cu₃O₇ for)
 IT Plastics, uses
 (thermoplastics, binder; optimized, melt-textured bulk samples
 based on high-temp. **superconductors** of compn.
 (Sm/Nd)Ba₂Cu₃O₇)
 IT 9002-89-5, Polyvinyl alcohol 9011-14-7, PMMA 9011-14-7D, PMMA,
 derivs.
 (binder; optimized, melt-textured bulk samples based on
 high-temp. **superconductors** of compn. (Sm/Nd)Ba₂Cu₃O₇)
 IT 1301-96-8, Silver monoxide 1304-76-3, Bismuth sesquioxide, uses
 1305-78-8, Calcium oxide, uses 1306-38-3, Cerium dioxide, uses
 1309-48-4, Magnesia, uses 1309-64-4, Antimony sesquioxide, uses
 1313-96-8, Niobium pentoxide 1314-15-4, Platinum dioxide
 1314-23-4, Zirconia, uses 1314-37-0, Ytterbium sesquioxide
 1314-62-1, Vanadium pentoxide, uses 1344-28-1, Alumina, uses
 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-22-4,
 Silver, uses 7440-45-1, Cerium, uses 7440-64-4, Ytterbium, uses
12009-21-1, Barium zirconium oxide (**BaZrO₃**)
 12036-35-0, Rhodium sesquioxide 13463-67-7, Titania, uses
 20667-12-3, Silver oxide (Ag₂O)
 (optimized, melt-textured bulk samples based on high-temp.
superconductors of compn. (Sm/Nd)Ba₂Cu₃O₇)
 IT 1313-97-9, Neodymium oxide (Nd₂O₃) 12060-58-1, Samarium oxide

(Sm₂O₃) 82642-06-6, Barium copper yttrium oxide (BaCuY₂O₅)
(optimized, melt-textured bulk samples based on high-temp.
superconductors of compn. (Sm/Nd)Ba₂Cu₃O₇)

IT 262358-77-0, Barium copper samarium oxide
(Ba_{1.8-2.2}Cu_{2.7-3.3}Sm_{0.8-1.8}O_{6.5-7}) 262358-78-1, Barium copper
neodymium oxide (Ba_{1.8-2.2}Cu_{2.7-3.3}Nd_{0.8-1.8}O_{6.5-7})
(optimized, melt-textured bulk samples based on high-temp.
superconductors of compn. (Sm/Nd)Ba₂Cu₃O₇)

IT 513-77-9, Barium carbonate 1304-28-5, Barium oxide, reactions
1317-38-0, Cupric oxide, reactions 57348-58-0, Barium copper oxide
(BaCuO₂)
(optimized, melt-textured bulk samples based on high-temp.
superconductors of compn. (Sm/Nd)Ba₂Cu₃O₇)

IT 82642-05-5, Barium copper samarium oxide (BaCuSm₂O₅)
262358-80-5, Barium copper neodymium oxide (BaCuNd₄O₈)
(optimized, melt-textured bulk samples based on high-temp.
superconductors of compn. (Sm/Nd)Ba₂Cu₃O₇)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L31 ANSWER 8 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 132:240782 HCA Full-text

TI Manuf. of HTSC articles from SmBa₂Cu₃O₇/Sm₂BaCuO₅ by in air melt
texturing

IN Kaiser, Axel; Bornemann, Hans

PA Forschungszentrum Karlsruhe G.m.b.H., Germany

SO Ger. Offen., 10 pp.

CODEN: GWXXBX

DT Patent

LA German

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
------------	------	------	-----------------	------

-----	---	-----	-----	
-------	-----	-------	-------	--

-------	--	--	--	--

PI DE 19841575	A1	20000323	DE 1998-19841575	
			199809	
			11	

<--

PRAI DE 1998-19841575 19980911 <--

AB The manuf. uses a powder metallurgy approach and includes (1) mixing powders of raw oxides (e.g., Sm-123 67.9, Sm-211 20.0, Ba₃Cu₅O_x 10.0, CeO₂ 2.0, and PtO₂ 0.1 wt.%), (2) melting the mixt. in air at 11500, (3) quenching to predetd. temp., e.g., 10800, (4) setting seed crystals (e.g., Nd-123 or Nd-422) on the melt surface, (5) slow cooling to predetd. temp., e.g., 9800, to grow oriented crystals, (6) fast cooling to room temp., and (7) heat treating of final crystals in air, argon, or argon/oxygen mixt. at 800-10100 for 6-24 h to provide desired properties of **superconductors** such as T_c and j_c. The manuf. of substantial SmBC HTSC allows to achieve the appropriate requirements to the optimal compn. and

properties suitable for the increase of the levitation force or for applications in the magnetic field. The handling in air simplifies the manuf., particularly applying of seed crystals and the use of a simple furnaces.

IT **110778-98-8D**, Barium copper samarium oxide (Ba₂Cu₃SmO₇),
oxygen-deficient
(Sm-123; manuf. of HTSC articles from SmBa₂Cu₃O₇/Sm₂BaCuO₅ by in
air melt texturing)
RN 110778-98-8 HCA
CN Barium copper samarium oxide (Ba₂Cu₃SmO₇) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	7	17778-80-2
Cu	3	7440-50-8
Ba	2	7440-39-3
Sm	1	7440-19-9

IT **82642-05-5D**, Barium copper samarium oxide (BaCuSm₂O₅),
oxygen-deficient
(Sm-211; manuf. of HTSC articles from SmBa₂Cu₃O₇/Sm₂BaCuO₅ by in
air melt texturing)
RN 82642-05-5 HCA
CN Barium copper samarium oxide (BaCuSm₂O₅) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	5	17778-80-2
Cu	1	7440-50-8
Ba	1	7440-39-3
Sm	2	7440-19-9

IT **12009-21-1**, Barium zirconium oxide (**BaZrO₃**)
(manuf. of HTSC articles from SmBa₂Cu₃O₇/Sm₂BaCuO₅ by in air melt
texturing)
RN 12009-21-1 HCA
CN Barium zirconium oxide (BaZrO₃) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

IC ICM C04B035-45

ICS C04B035-505

CC 57-2 (Ceramics)

Section cross-reference(s): 76

IT **Superconducting** critical current density

Superconducting critical temperature

(Sm-123/Sm-211; manuf. of HTSC articles from SmBa₂Cu₃O₇/Sm₂BaCuO₅ by in air melt texturing)

IT **Superconductors**

Superconductors

(ceramic, high temp.; manuf. of HTSC articles from SmBa₂Cu₃O₇/Sm₂BaCuO₅ by in air melt texturing)

IT Ceramics

Ceramics

(**superconductors**, high temp.; manuf. of HTSC articles from SmBa₂Cu₃O₇/Sm₂BaCuO₅ by in air melt texturing)

IT **110778-98-8D**, Barium copper samarium oxide (Ba₂Cu₃SmO₇),

oxygen-deficient

(Sm-123; manuf. of HTSC articles from SmBa₂Cu₃O₇/Sm₂BaCuO₅ by in air melt texturing)

IT **82642-05-5D**, Barium copper samarium oxide (BaCuSm₂O₅),

oxygen-deficient

(Sm-211; manuf. of HTSC articles from SmBa₂Cu₃O₇/Sm₂BaCuO₅ by in air melt texturing)

IT 513-77-9, Barium carbonate 1304-28-5, Barium oxide (BaO), uses

1304-76-3, Bismuth oxide (Bi₂O₃), uses 1305-79-9, Calcium peroxide

(CaO₂) 1306-38-3, Cerium oxide (CeO₂), uses 1309-48-4, Magnesium

oxide, uses 1309-64-4, Antimony oxide (Sb₂O₃), uses 1313-96-8,

Niobium oxide (Nb₂O₅) 1314-23-4, Zirconium oxide, uses

1314-37-0, Ytterbium oxide (Yb₂O₃) 1314-62-1, Vanadium oxide

(V₂O₅), uses 1317-38-0, Copper oxide (CuO), uses 1344-28-1,

Aluminum oxide, uses 7440-16-6, Rhodium, uses 7440-45-1, Cerium,

uses 7440-61-1, Uranium, uses 11113-93-2, Uranium oxide

11129-89-8, Platinum oxide **12009-21-1**, Barium zirconium

oxide (**BaZrO₃**) 12036-35-0, Rhodium oxide (Rh₂O₃)

12060-58-1, Samarium oxide (Sm₂O₃) 13463-67-7, Titanium oxide,

uses 20667-12-3, Silver oxide

(manuf. of HTSC articles from SmBa₂Cu₃O₇/Sm₂BaCuO₅ by in air melt texturing)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L31 ANSWER 9 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 131:148041 HCA Full-text

TI Process for manufacturing melt-textured volume probes based on samarium barium copper oxide (Sm₁Ba₂Cu₃O₇; Sm-123) high-temperature

superconductors

IN Kaiser, Axel; Bornemann, Hans; Burgkhardt, Thomas; Hennig, Wolfgang

PA Forschungszentrum Karlsruhe G.m.b.H., Germany

SO Ger., 6 pp.

CODEN: GWXXAW

DT Patent

LA German

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
------------	------	------	-----------------	------

-----	---	-----	-----	-----
-------	-----	-------	-------	-------

PI	DE 19748743	C1	19990819	DE 1997-19748743
				199711
				05

<--

PRAI DE 1997-19748743 19971105 <--

AB This process, in which the final product contains Sm-123 ≥ 50 and Sm-211 5-50 and/or Nd-422 0-45 and/or Y-211 0-45 wt.%, comprises (A) prepg. a base mixt. for the greenware using as matrix-forming powder Sm_{1.8-1.0}Ba_{2-y}Cu_{3-z}O_{7-x} ($0 < x < 0.5$; $-0.2 < y < 0.2$; $0.3 < z < 0.3$) mixed with Sm₂O₃ 0-20 and/or Sm₂BaCuO₅ (Sm-211) 0-50 and/or Y₂BaCuO₅ (Y-211) 0-45 and/or Nd₄Ba₂Cu₂O₁₀ (Nd-422) 0-45 wt.%, and, if not already mixed with the starting material, adding as additive PtO₂ or Pt 0.1-1 and/or CeO₂ or Ce 0.1-2 and/or Rh₂O₃ or Rh 0.005-1 and/or Ag₂O or AgO 0-6 and/or Yb₂O₃ 0-2 wt.%, and adding (to max. 17 wt.%) CuO 0-4 and/or BaCuO_x 0-6 and/or BaO 0-5 and/or CaO 0-2 and/or MgO 0-2 and/or Al₂O₃ 0-2 and/or **BaZrO₃** (or, correspondingly, BaO + ZrO₂) 0-15 and/or ZrO₂ 0-1 and/or V₂O₅ 0-1 and/or TiO₂ 0-1 and/or Nb₂O₅ 0-1 and/or Sb₂O₃ 0-1 and/or Bi₂O₃ 0-1 wt.%, using (optionally different) particle sizes in the range of 4 nm to 80 μ m, (B) homogenizing the mixt. in, e.g., a ball mill, during which a C uptake of ≤ 0.18 wt.%, via atm. CO₂ and/or from an org. binder, is allowable, (C) molding and densifying the mixt., and (D) melt-texturizing the greenware by providing a Nd-123, Sm-123, MgO, or corresponding-type seed crystal whose decompn. temp. is higher than the max. temp. of the heat treatment. The greenware is then subjected to a temp. program in which the greenware is heated at 400 degree/h to 800°, further heated at 300 degree/h to Tmax (Tmax is .apprx.1020° at O partial pressure 80 Pa, or 1050° at O partial pressure 800 Pa), held at Tmax for ≤ 30 min, cooled (rapidly) at 500 degree/h to .apprx.980° at O partial pressure 800 Pa, or to 960° at O partial pressure 80 Pa, cooled (slowly) at 1-2 degree/h to .apprx.880° at O partial pressure 800 Pa, or to 885° at O partial pressure 80 Pa, further cooled at 60 degree/h to 800°, and cooled to ambient temp. at 300 degree/h. This process can be automated and permits melt-texturizing under vacuum with seed crystals of suitable texture, and provides vol. probes for use in self-stabilizing contact-free magnetic bearings.

IT 12009-21-1, Barium zirconium oxide **82642-05-5**,

Barium copper samarium oxide (BaCuSm₂O₅) **236108-66-0**,

Barium copper samarium oxide (Ba_{1.8-2.2}Cu_{2.7-3.3}Sm_{1-1.8}O_{6.5-7})

(comps. contg.; in manuf. of melt-textured vol. probes based on

barium copper samarium oxide high-temp. **superconductors**

)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO₃) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

RN 82642-05-5 HCA

CN Barium copper samarium oxide (BaCuSm2O5) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	5	17778-80-2
Cu	1	7440-50-8
Ba	1	7440-39-3
Sm	2	7440-19-9

RN 236108-66-0 HCA

CN Barium copper samarium oxide (Ba1.8-2.2Cu2.7-3.3Sm1-1.8O6.5-7) (9Cl)
(CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	6.5 - 7	17778-80-2
Cu	2.7 - 3.3	7440-50-8
Ba	1.8 - 2.2	7440-39-3
Sm	1 - 1.8	7440-19-9

IT **110778-98-8P**, Barium copper samarium oxide (Ba2Cu3SmO7)
(high-temp. **superconductors**; manuf. of melt-textured
vol. probes based on)

RN 110778-98-8 HCA

CN Barium copper samarium oxide (Ba2Cu3SmO7) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	7	17778-80-2
Cu	3	7440-50-8
Ba	2	7440-39-3
Sm	1	7440-19-9

IC ICM C04B035-45

ICS C04B035-50

CC 57-2 (Ceramics)

Section cross-reference(s): 49, 76

ST samarium barium copper oxide high temp **superconductor**;
yttrium barium copper oxide; neodymium barium copper oxide; melt
textured vol probe oxide

IT Crystallization

(agents; in manuf. of melt-textured vol. probes based on barium
copper samarium oxide high-temp. **superconductors**)

IT Waxes

(binder; in manuf. of melt-textured vol. probes based on barium
copper samarium oxide high-temp. **superconductors**)

IT Acrylic polymers, uses

Polyvinyl butyrals

(binders; in manuf. of melt-textured vol. probes based on barium
copper samarium oxide high-temp. **superconductors**)

IT **Superconductors**

(high-temp., barium copper samarium oxide; manuf. of
melt-textured vol. probes based on)

IT Firing (heat treating)

(protocol for; in manuf. of melt-textured vol. probes based on
barium copper samarium oxide high-temp. **superconductors**
)

IT 9002-89-5

(binder; in manuf. of melt-textured vol. probes based on barium
copper samarium oxide high-temp. **superconductors**)

IT 79-10-7D, Acrylic acid, esters, polymers 79-41-4D, Methacrylic
acid, esters, polymers

(binders; in manuf. of melt-textured vol. probes based on barium
copper samarium oxide high-temp. **superconductors**)

IT 1301-96-8, Silver oxide (AgO) 1304-28-5, Barium oxide, processes
1304-76-3, Bismuth oxide, processes 1306-38-3, Cerium dioxide,
processes 1309-48-4, Magnesia, processes 1309-64-4, Antimony
trioxide, processes 1313-96-8, Niobium pentoxide 1314-23-4,
Zirconia, processes 1314-37-0, Ytterbium oxide 1314-62-1,
Vanadium pentoxide, processes 1317-38-0, Cupric oxide, processes
1344-28-1, Aluminum oxide (Al₂O₃), processes 7440-06-4, Platinum,
processes 7440-16-6, Rhodium, processes 7440-45-1, Cerium,
processes 11129-89-8, Platinum oxide **12009-21-1**, Barium
zirconium oxide 12060-58-1, Samarium oxide 12680-36-3, Rhodium
oxide 13463-67-7, Titania, processes 20667-12-3, Silver oxide
(Ag₂O) 57348-59-1, Barium copper oxide **82642-05-5**,
Barium copper samarium oxide (BaCuSm₂O₅) 82642-06-6, Barium copper
yttrium oxide (BaCuY₂O₅) 90804-74-3, Barium copper neodymium oxide
(BaCuNd₂O₅) **236108-66-0**, Barium copper samarium oxide
(Ba_{1.8}-2.2Cu_{2.7}-3.3Sm₁-1.8O_{6.5}-7)

(compns. contg.; in manuf. of melt-textured vol. probes based on

barium copper samarium oxide high-temp. **superconductors**

)

IT **110778-98-8P**, Barium copper samarium oxide ($\text{Ba}_2\text{Cu}_3\text{SmO}_7$)
(high-temp. **superconductors**; manuf. of melt-textured
vol. probes based on)

IT 111591-04-9, Barium copper neodymium oxide ($\text{Ba}_2\text{Cu}_3\text{NdO}_7$)
(neodymium-123, seed crystals contg.; in manuf. of melt-textured
vol. probes based on barium copper samarium oxide high-temp.
superconductors)

IT 7782-44-7, Oxygen, uses
(partial pressure of, control of; in heat-treatment in manuf. of
melt-textured vol. probes based on barium copper samarium oxide
high-temp. **superconductors**)

RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L31 ANSWER 10 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 131:66670 HCA Full-text

TI Preparation of melt-textured bulk samples based on high-temperature
superconductor $\text{NdBa}_2\text{Cu}_3\text{O}_7$ (Nd-123)

IN Kaiser, Axel; Bornemann, Hans; Burgkhardt, Thomas; Hennig, Wolfgang

PA Forschungszentrum Karlsruhe G.m.b.H., Germany

SO Ger., 6 pp.

CODEN: GWXXAW

DT Patent

LA German

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
------------	------	------	-----------------	------

-----	---	-----	-----	
-------	-----	-------	-------	--

PI DE 19748742	C1	19990701	DE 1997-19748742	
			199711	
			05	

<--

PRAI DE 1997-19748742 19971105 <--

AB The compn. and the starting materials are varied to achieve the optimum compns. for various
requirements. The final product comprises Nd-123 ≥ 50 , $\text{Nd}_4\text{Ba}_2\text{Cu}_2\text{O}_{10}$ 5-50, Y_2BaCuO_5 0-45,
and/or $\text{Sm}_2\text{BaCuO}_5$ 0-45 wt.%.

IT **12009-21-1**, Barium zirconate (**BaZrO_3**)
(prepn. of melt-textured bulk samples based on high-temp.
superconductor $\text{NdBa}_2\text{Cu}_3\text{O}_7$ contg.)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO_3) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	

O		3		17778-80-2
Zr		1		7440-67-7
Ba		1		7440-39-3

IT **82642-05-5P**, Barium copper samarium oxide (BaCuSm2O5)
 (prepn. of melt-textured bulk samples based on high-temp.
superconductor NdBa2Cu3O7 contg.)

RN 82642-05-5 HCA

CN Barium copper samarium oxide (BaCuSm2O5) (CA INDEX NAME)

Component		Ratio		Component
		Registry Number		

O		5		17778-80-2
Cu		1		7440-50-8
Ba		1		7440-39-3
Sm		2		7440-19-9

IC ICM C04B035-45

ICS C04B035-50

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 38, 57

ST high temp **superconductor** neodymium barium cuprate melt
 textured prep; yttrium barium cuprate contg melt textured high temp
superconductor; samarium barium cuprate contg melt textured
 high temp **superconductor**

IT Polyvinyl butyrals

Waxes

(binders; prep. of melt-textured bulk samples based on
 high-temp. **superconductor** NdBa2Cu3O7 contg.)

IT **Superconductors**

(cuprate; prep. of melt-textured bulk samples based on
 high-temp. **superconductor** NdBa2Cu3O7 (Nd-123))

IT **Superconductors**

(high-temp.; prep. of melt-textured bulk samples based on
 high-temp. **superconductor** NdBa2Cu3O7 (Nd-123))

IT Binders

(prep. of melt-textured bulk samples based on high-temp.
superconductor NdBa2Cu3O7 contg.)

IT Plastics, uses

(thermoplastics, binders; prep. of melt-textured bulk samples
 based on high-temp. **superconductor** NdBa2Cu3O7 contg.)

IT 79-10-7D, Acrylic acid, esters, polymers 79-41-4D, Methacrylic
 acid, esters, polymers 9002-89-5, Polyvinyl alcohol

(binder; prep. of melt-textured bulk samples based on high-temp.

superconductor NdBa₂Cu₃O₇ contg.)

IT 111591-04-9P, Barium copper neodymium oxide (Ba₂Cu₃NdO₇)
 (prepn. of melt-textured bulk samples based on high-temp.
superconductor NdBa₂Cu₃O₇ (Nd-123))

IT 1301-96-8, Silver oxide (AgO) 1304-28-5, Barium oxide (BaO), uses
 1304-76-3, Bismuth oxide (Bi₂O₃), uses 1305-78-8, Calcium oxide
 (CaO), uses 1306-38-3, Cerium oxide (CeO₂), uses 1309-48-4,
 Magnesium oxide (MgO), uses 1309-64-4, Antimony oxide (Sb₂O₃),
 uses 1313-96-8, Niobium oxide (Nb₂O₅) 1314-15-4, Platinum oxide
 (PtO₂) 1314-23-4, Zirconium oxide (ZrO₂), uses 1314-37-0,
 Ytterbium oxide (Yb₂O₃) 1314-62-1, Vanadium oxide (V₂O₅), uses
 1317-38-0, Cupric oxide, uses 1344-28-1, Aluminum oxide (Al₂O₃),
 uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses
 7440-45-1, Cerium, uses **12009-21-1**, Barium zirconate (
BaZrO₃) 12036-35-0, Rhodium oxide (Rh₂O₃) 13463-67-7,
 Titanium dioxide, uses 20667-12-3, Silver oxide (Ag₂O)
 57348-59-1, Barium copper oxide
 (prepn. of melt-textured bulk samples based on high-temp.
superconductor NdBa₂Cu₃O₇ contg.)

IT **82642-05-5P**, Barium copper samarium oxide (BaCuSm₂O₅)
 82642-06-6P, Barium copper yttrium oxide (BaCuY₂O₅) 90804-74-3P,
 Barium copper neodymium oxide (BaCuNd₂O₅)
 (prepn. of melt-textured bulk samples based on high-temp.
superconductor NdBa₂Cu₃O₇ contg.)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L31 ANSWER 11 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 130:161897 HCA Full-text

TI Liquid phase epitaxy of rare earth barium cuprate

superconductors through a porous material

IN Evetts, Jan Edgar; Glowacki, Bartlomiej Andrej; Kursumovic, Ahmed;
 Henson, Ronald

PA Cambridge Advanced Materials Ltd., UK

SO PCT Int. Appl., 15 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----

PI WO 9907923	A1	19990218	WO 1998-GB2333	
			199808	
			04	

<--

W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ,
DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP,
KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK,
MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL,
TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG,
KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK,
ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

AU 9886376 A 19990301 AU 1998-86376
199808
04

<--

EP 1005580 A1 20000607 EP 1998-937651
199808
04

<--

R: BE, CH, DE, DK, ES, FR, GB, IT, LI, NL, SE, FI

PRAI GB 1997-16571 A 19970805 <--

WO 1998-GB2333 W 19980804 <--

AB A method of coating a substrate by LPE comprises applying a flux, e.g. within a crucible, to the
substrate through a porous material comprising ≥ 1 rare earth elements or their compds. that are sol. in
the flux.

IT 12009-21-1, Barium zirconate (**BaZrO₃**)
(crucible; in liq. phase epitaxy of rare earth barium cuprate
superconductors through a porous material)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO₃) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

IT 82642-05-5, Barium copper samarium oxide (BaCuSm₂O₅)
(liq. phase epitaxy of rare earth barium cuprate
superconductors through a porous material contg.)

RN 82642-05-5 HCA

CN Barium copper samarium oxide (BaCuSm₂O₅) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	5	17778-80-2

Cu		1		7440-50-8
Ba		1		7440-39-3
Sm		2		7440-19-9

IT **110778-98-8P**, Barium copper samarium oxide (Ba₂Cu₃SmO₇)
 (superconductor; liq. phase epitaxy of rare earth
 barium cuprate **superconductors** through a porous
 material)

RN 110778-98-8 HCA

CN Barium copper samarium oxide (Ba₂Cu₃SmO₇) (CA INDEX NAME)

Component		Ratio		Component
		Registry Number		
=====+				
O		7		17778-80-2
Cu		3		7440-50-8
Ba		2		7440-39-3
Sm		1		7440-19-9

IC ICM C30B019-04

ICS C30B029-22

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 57, 75

ST liq phase epitaxy rare earth barium cuprate **superconductor**
 ; porous material LPE cuprate **superconductor**

IT **Superconductors**
 (cuprate; liq. phase epitaxy of rare earth barium cuprate
superconductors through a porous material)

IT Fluxes
 (in liq. phase epitaxy of rare earth barium cuprate
superconductors through a porous material)

IT Liquid phase epitaxy
 Porous materials
 (liq. phase epitaxy of rare earth barium cuprate
superconductors through a porous material)

IT Crucibles
 (liq. phase epitaxy of rare earth barium cuprate
superconductors through a porous material using)

IT **12009-21-1**, Barium zirconate (BaZrO₃)
 (crucible; in liq. phase epitaxy of rare earth barium cuprate
superconductors through a porous material)

IT 57348-59-1, Barium copper oxide 220276-11-9, Barium copper
 fluoride oxide
 (flux; in liq. phase epitaxy of rare earth barium cuprate
superconductors through a porous material)

IT 82642-01-1, Barium copper erbium oxide (BaCuEr₂O₅) 82642-02-2,

Barium copper europium oxide (BaCuEu₂O₅) 82642-03-3, Barium copper gadolinium oxide (BaCuGd₂O₅) 82642-04-4, Barium copper holmium oxide (BaCuHo₂O₅) **82642-05-5**, Barium copper samarium oxide (BaCuSm₂O₅) 82642-06-6, Barium copper yttrium oxide (BaCuY₂O₅) 82642-07-7, Barium copper ytterbium oxide (BaCuYb₂O₅) 90804-74-3, Barium copper neodymium oxide (BaCuNd₂O₅)

(liq. phase epitaxy of rare earth barium cuprate **superconductors** through a porous material contg.)

IT 109064-29-1P, Barium copper yttrium oxide (Ba₂Cu₃Y₂O₇)
110778-86-4P, Barium copper europium oxide (Ba₂Cu₃Eu₂O₇)
110778-98-8P, Barium copper samarium oxide (Ba₂Cu₃Sm₂O₇)
110779-01-6P, Barium copper ytterbium oxide (Ba₂Cu₃Yb₂O₇)
111590-97-7P, Barium copper erbium oxide (Ba₂Cu₃Er₂O₇)
111590-98-8P, Barium copper gadolinium oxide (Ba₂Cu₃Gd₂O₇)
111591-00-5P, Barium copper holmium oxide (Ba₂Cu₃Ho₂O₇)
111591-04-9P, Barium copper neodymium oxide (Ba₂Cu₃Nd₂O₇)
(**superconductor**; liq. phase epitaxy of rare earth barium cuprate **superconductors** through a porous material)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L31 ANSWER 12 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 128:186629 HCA Full-text

TI Top-seeded solution growth of SmBa₂Cu₃O_{7-δ} seed crystals for melt texturing of YBa₂Cu₃O_{7-δ}

AU Krauns, Ch.; Bringmann, B.; Brandt, C.; Ullrich, M.; Heinemann, K.; Freyhardt, H. C.

CS Institut für Metallphysik, Universität Göttingen, Göttingen, D-37073, Germany

SO Institute of Physics Conference Series (1997), 158(Applied Superconductivity 1997, Vol. 2), 833-836
CODEN: IPCSEP; ISSN: 0951-3248

PB Institute of Physics Publishing

DT Journal

LA English

AB SmBa₂Cu₃O_{7-δ} (Sm123) seed crystals were fabricated by a Top-Seeded-Soln.-Growth (TSSG) method using **BaZrO₃** crucibles. Crystals up to a size of 100 mm² in the a-b plane were grown. In this presentation, the crystal growth will be described and the growth parameters are discussed. Also, the **superconducting** and structural properties of the Sm123 seed crystals will be presented. These seed crystals were successfully employed for the melt texturing of YBa₂Cu₃O_{7-δ} (Y123) monoliths of diams. up to 50 mm. The **superconducting** and structural properties of the melt-textured Y123 detd. by hall probe measurements and optical microscopy will be presented.

IT **110778-98-8D**, Barium copper samarium oxide (Ba₂Cu₃Sm₂O₇), oxygen-deficient
(top-seeded soln. growth of SmBa₂Cu₃O_{7-δ} seed crystals for

melt texturing of YBa₂Cu₃O_{7-δ})

RN 110778-98-8 HCA

CN Barium copper samarium oxide (Ba₂Cu₃SmO₇) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Cu	3	7440-50-8
Ba	2	7440-39-3
Sm	1	7440-19-9

CC 75-1 (Crystallography and Liquid Crystals)

Section cross-reference(s): 76

IT Remanence

Superconductivity

(of barium copper samarium oxide seed crystals)

IT Crystal growth

Crystal nucleation

Superconductors

(top-seeded soln. growth of SmBa₂Cu₃O_{7-δ} seed crystals for melt texturing of YBa₂Cu₃O_{7-δ})

IT 109064-29-1D, Barium copper yttrium oxide (Ba₂Cu₃YO₇), oxygen-deficient **110778-98-8D**, Barium copper samarium oxide (Ba₂Cu₃SmO₇), oxygen-deficient

(top-seeded soln. growth of SmBa₂Cu₃O_{7-δ} seed crystals for melt texturing of YBa₂Cu₃O_{7-δ})

RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L31 ANSWER 13 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 124:326359 HCA Full-text

TI Thermodynamic stability of Sm_{1+x}Ba_{2-x}Cu₃O_y (0 ≤ x ≤ 0.4)

AU Xing, Xianran; Qiao, Zhiyu; Wei, Shoukun

CS Univ. Sci. Technol. Beijing, Beijing, 100083, Peop. Rep. China

SO Jinshu Xuebao (1996), 32(2), 144-148

CODEN: CHSPA4; ISSN: 0412-1961

PB Kexue

DT Journal

LA Chinese

AB An assembly for performing emf. measurements using a CaF₂ **single crystal** as a solid state electrolyte has been constructed. From the emf. data, the std. Gibbs energies of formation of member oxides in the Sm-Ba-Cu-O system were calcd. The thermodyn. stability of the complex oxide Sm_{1+x}Ba_{2-x}Cu₃O_y (0 ≤ x ≤ 0.4) decreases with the increase in the solid soly. x.

IT **12009-21-1**, Barium zirconium oxide (**bazro3**)

(std. Gibbs energies of formation of oxides)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO₃) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

IT 111419-82-0, Barium copper samarium oxide

(thermodn. stability of Sm_{1+x}Ba_{2-x}Cu₃O_y (0 ≤ x ≤ 0.4))

RN 111419-82-0 HCA

CN Barium copper samarium oxide (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	x	17778-80-2
Cu	x	7440-50-8
Ba	x	7440-39-3
Sm	x	7440-19-9

IT 82642-05-5, Samarium barium copper oxide (Sm₂BaCuO₅)

121871-36-1, Barium copper samarium oxide (Ba₂Cu₃SmO_{6.5})

124924-04-5, Barium copper samarium oxide

(Ba_{1.6}Cu₃Sm_{1.4}O_{6.7})

(thermodn. stability of Sm_{1+x}Ba_{2-x}Cu₃O_y (0 ≤ x ≤ 0.4) in view of the formation and reaction energies of the system oxides)

RN 82642-05-5 HCA

CN Barium copper samarium oxide (BaCuSm₂O₅) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	5	17778-80-2
Cu	1	7440-50-8
Ba	1	7440-39-3
Sm	2	7440-19-9

RN 121871-36-1 HCA

CN Barium copper samarium oxide (Ba₂Cu₃SmO_{6.5}) (9CI) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	6.5	17778-80-2
Cu	3	7440-50-8
Ba	2	7440-39-3
Sm	1	7440-19-9

RN 124924-04-5 HCA

CN Barium copper samarium oxide (Ba_{1.6}Cu₃Sm_{1.4}O_{6.7}) (9CI) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	6 - 7	17778-80-2
Cu	3	7440-50-8
Ba	1.6	7440-39-3
Sm	1.4	7440-19-9

CC 69-2 (Thermodynamics, Thermochemistry, and Thermal Properties)

Section cross-reference(s): 76

IT 1314-23-4, Zirconium oxide (zro2), properties **12009-21-1**,
Barium zirconium oxide (**bazro3**)

(std. Gibbs energies of formation of oxides)

IT **111419-82-0**, Barium copper samarium oxide
(thermodn. stability of Sm_{1+x}Ba_{2-x}Cu₃O_y (0 ≤ x ≤ 0.4))

IT 12009-24-4, Barium samarium oxide (Basm₂O₄) 12054-02-3, Samarium cuprate (Sm₂CuO₄) 57348-58-0, Barium cuprate (BaCuO₂) **82642-05-5**, Samarium barium copper oxide (Sm₂BaCuO₅) **121871-36-1**, Barium copper samarium oxide (Ba₂Cu₃smO_{6.5}) **124924-04-5**, Barium copper samarium oxide (Ba_{1.6}Cu₃Sm_{1.4}O_{6.7})

(thermodn. stability of Sm_{1+x}Ba_{2-x}Cu₃O_y (0 ≤ x ≤ 0.4) in view of the formation and reaction energies of the system oxides)

L31 ANSWER 14 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 124:42714 HCA [Full-text](#)

TI Plasma-sprayed high-temperature **superconductor** thick layers on metallic and ceramic substrates. Production, after treatment, microstructure, and properties

AU Aschern, Winfried

CS Inst. Werkst. Energ., Forschungszentrum Juelich GmbH, Juelich, D-52425, Germany

SO Berichte des Forschungszentrums Juelich (1995), Juel-3073,
149 pp.

CODEN: FJBEE5; ISSN: 0366-0885

DT Report

LA German

AB The plasma spraying was studied of YBa₂Cu₃O₇ and Bi₂Sr₂CaCu₂O₈ thick **superconducting** films on ceramic and metal substrates at low pressures and at atm. pressures. The initial films have multiple phases and are not **superconducting**. Thermal treatment in order to produce an optimum microstructure is necessary. Sintering and melt-texturing in different atms. were used as after treatments. The relation between **supercond.** and microstructure is discussed. The interactions between the films and the substrates were studied. Buffer layers were tested. Magnetic shields were developed using these processes.

IT 12009-21-1, Barium zirconium oxide (BaZrO₃)
(interface reaction product; microstructure and **supercond**
. of processed plasma-sprayed cuprate **superconductor**
films)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO₃) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

IT 110778-98-8, Barium copper samarium oxide (Ba₂Cu₃SmO₇)
(substrate; microstructure and **supercond.** of processed
plasma-sprayed cuprate **superconductor** films)

RN 110778-98-8 HCA

CN Barium copper samarium oxide (Ba₂Cu₃SmO₇) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	7	17778-80-2
Cu	3	7440-50-8
Ba	2	7440-39-3
Sm	1	7440-19-9

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 56, 57

ST barium copper yttrium oxide plasma spraying; bismuth calcium copper
strontium oxide **superconductor**; sintering cuprate
superconductor film microstructure; melt texturing cuprate
superconductor film microstructure; buffer layer cuprate

superconductor substrate; magnetic **superconducting**
shield cuprate

IT Crystallization

Diffusion

Electric resistance

Magnetic susceptibility

(microstructure and **supercond.** of processed
plasma-sprayed cuprate **superconductor** films)

IT Air

(spraying atm.; microstructure and **supercond.** of
processed plasma-sprayed cuprate **superconductor** films)

IT **Superconductivity**

(crit. c.d., microstructure and **supercond.** of processed
plasma-sprayed cuprate **superconductor** films)

IT **Superconductivity**

(crit. temp., microstructure and **supercond.** of
processed plasma-sprayed cuprate **superconductor** films)

IT **Superconductor** devices

(magnetic shields, microstructure and **supercond.** of
processed plasma-sprayed cuprate **superconductor** films)

IT Shields

(magnetic, **superconductive**, microstructure and
supercond. of processed plasma-sprayed cuprate
superconductor films)

IT 7440-22-4, Silver, uses

(binder for bismuth calcium copper strontium oxide;
microstructure and **supercond.** of processed
plasma-sprayed cuprate **superconductor** films)

IT 12267-77-5, Barium cerium oxide (BaCeO_3)

(cerium dioxide interface reaction product; microstructure and
supercond. of processed plasma-sprayed cuprate
superconductor films)

IT 513-77-9, Barium carbonate 1314-36-9, Yttrium sesquioxide,
formation (nonpreparative) 1317-39-1, Cuprous oxide, formation
(nonpreparative) 37190-19-5, Barium copper oxide (BaCu_2O_2)
82642-06-6, Barium copper yttrium oxide (BaCuY_2O_5) 109489-85-2,
Barium copper yttrium oxide ($\text{Ba}_2\text{Cu}_3\text{YO}_6$)

(impurity phase; microstructure and **supercond.** of
processed plasma-sprayed cuprate **superconductor** films)

IT 57348-58-0, Barium copper oxide (BaCuO_2)

(impurity phase; microstructure and **supercond.** of
processed plasma-sprayed cuprate **superconductor** films)

IT **12009-21-1**, Barium zirconium oxide (BaZrO_3)

(interface reaction product; microstructure and **supercond.**
of processed plasma-sprayed cuprate **superconductor**
films)

- IT 1317-38-0, Cupric oxide, reactions
(interface reaction; microstructure and **supercond.** of
processed plasma-sprayed cuprate **superconductor** films)
- IT 117188-05-3P, Calcium copper strontium oxide 124230-96-2P, Calcium
copper strontium oxide ((Ca,Sr)₂CuO₃) 125648-74-0P, Calcium copper
strontium oxide (Ca_{0.1}CuSr_{0.1}O₂)
(intermediate; microstructure and **supercond.** of
processed plasma-sprayed cuprate **superconductor** films)
- IT 109064-29-1, Barium copper yttrium oxide (Ba₂Cu₃YO₇) 115866-34-7,
Bismuth calcium copper strontium oxide (Bi₂CaCu₂Sr₂O₈)
(microstructure and **supercond.** of processed
plasma-sprayed cuprate **superconductor** films)
- IT 149320-43-4, Bismuth calcium strontium oxide (Bi₂Ca_{0.3}Sr_{0.3}O₆)
(microstructure and **supercond.** of processed
plasma-sprayed cuprate **superconductor** films)
- IT 7440-37-1, Argon, processes
(spraying atm.; microstructure and **supercond.** of
processed plasma-sprayed cuprate **superconductor** films)
- IT 1309-48-4, Magnesia, processes 7440-02-0, Nickel, processes
7783-40-6, Magnesium fluoride 12606-02-9, Inconel 600
12611-78-8, AISI 321 110778-98-8, Barium copper samarium
oxide (Ba₂Cu₃SmO₇)
(substrate; microstructure and **supercond.** of processed
plasma-sprayed cuprate **superconductor** films)
- IT 1306-38-3, Cerium dioxide, processes 11068-69-2, Nimonic 75
12047-27-7, Barium titanate, processes 64417-98-7, Yttrium
zirconium oxide 171740-96-8
(substrate; microstructure and **supercond.** of processed
plasma-sprayed cuprate **superconductor** films)

L31 ANSWER 15 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 120:93216 HCA Full-text

TI Production of oxide **superconductors** having large magnetic
levitation force

IN Kondoh, Akihiro; Murakami, Masato; Takaichi, Hiroshi; Koshizuka,
Naoki; Tanaka, Shoji; Kagiya, Syoichi

PA International Superconductivity Technology Center, Japan; Kawasaki
Jukogyo Kabushiki Kaisha; Hokuriku Electric Power Co.; Nippon Steel
Corp.

SO Eur. Pat. Appl., 20 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----

 PI EP 562640 A1 19930929 EP 1993-105112
 199303
 27

<--
 EP 562640 B1 19970924
 R: DE, FR, GB
 JP 05279032 A 19931026 JP 1992-101952
 199203
 27

<--
 JP 3115695 B2 20001211
 JP 05279034 A 19931026 JP 1992-101954
 199203
 27

<--
 JP 3115696 B2 20001211
 US 5474976 A 19951212 US 1993-39561
 199303
 29

<--
 PRAI JP 1992-101952 A 19920327 <--
 JP 1992-101954 A 19920327 <--

AB A method for producing an REBaCuO oxide **superconductor** having large magnetic levitation force, where RE = Y, Sm, Eu, Gd, Dy, Ho, Er, or Yb, involves the steps of using a raw material mixt. as the starting feed, heating the raw material mixt. for partial melting, followed by cooling and solidification, pulverizing and mixing the resulting solid, shaping the resulting mixt. into a given shape, placing or embedding nucleants on or in the resulting shape, followed by heating for partial melting, and cooling the resulting partial melt to a temp. at which a **superconducting** phase starts to form, followed by slow cooling, whereby the **superconducting** phase is preferentially formed and grown from a nucleation site.

IT 12009-21-1, Barium zirconium oxide (**BaZrO3**)
 82642-05-5, Barium copper samarium oxide (BaCuSm2O5)
 (nucleant, in prepn. of rare earth barium copper oxide
superconductors having large magnetic levitation force)
 RN 12009-21-1 HCA
 CN Barium zirconium oxide (BaZrO3) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

RN 82642-05-5 HCA

CN Barium copper samarium oxide (BaCuSm2O5) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	5	17778-80-2
Cu	1	7440-50-8
Ba	1	7440-39-3
Sm	2	7440-19-9

IT **111419-82-0P**, Barium copper samarium oxide
(**superconductor**, having large magnetic levitation
force, prepn. of)

RN 111419-82-0 HCA

CN Barium copper samarium oxide (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	x	17778-80-2
Cu	x	7440-50-8
Ba	x	7440-39-3
Sm	x	7440-19-9

IC ICM H01L039-24

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 57, 77

ST oxide **superconductor** prodn; barium copper rare earth oxide
superconductor

IT **Superconductors**

(rare earth barium copper oxide, having large magnetic levitation
force, prepn. of)

IT 1306-38-3, Cerium oxide (CeO₂), uses 1308-96-9, Europium oxide
(Eu₂O₃) 1309-48-4, Magnesium oxide (MgO), uses 1312-81-8,
Lanthanum oxide (La₂O₃) 1313-97-9, Neodymium oxide (Nd₂O₃)
1314-23-4, Zirconium oxide (ZrO₂), uses 1314-36-9, Yttrium oxide
(Y₂O₃), uses 1314-37-0, Ytterbium oxide (Yb₂O₃) 7439-88-5,
Iridium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses
7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8,
Ruthenium, uses 12009-18-6, Barium tin oxide (BaSnO₃)
12009-21-1, Barium zirconium oxide (**BaZrO₃**)
12055-62-8, Holmium oxide (Ho₂O₃) 12060-58-1, Samarium oxide
(Sm₂O₃) 12060-59-2, Strontium titanium oxide (SrTiO₃)
12061-16-4, Erbium oxide (Er₂O₃) 12064-62-9, Gadolinium oxide
(Gd₂O₃) 82642-01-1, Barium copper erbium oxide (BaCuEr₂O₅)
82642-02-2, Barium copper europium oxide (BaCuEu₂O₅) 82642-04-4,

Barium copper holmium oxide (BaCuHo2O5) **82642-05-5**, Barium copper samarium oxide (BaCuSm2O5) 82642-07-7, Barium copper ytterbium oxide (BaCuYb2O5) 111419-84-2, Barium copper neodymium oxide

(nucleant, in prepn. of rare earth barium copper oxide **superconductors** having large magnetic levitation force)

IT 20667-12-3, Silver oxide (Ag2O)

(prepn. of oxide **superconductors** contg., having large magnetic levitation force)

IT 107539-20-8P, Barium copper yttrium oxide 109457-22-9P, Barium copper dysprosium oxide 109457-23-0P, Barium copper erbium oxide 109457-24-1P, Barium copper europium oxide 109489-92-1P, Barium copper holmium oxide 110687-33-7P, Barium copper ytterbium oxide 110687-67-7P, Barium copper gadolinium oxide **111419-82-0P**,

Barium copper samarium oxide

(**superconductor**, having large magnetic levitation force, prepn. of)

L31 ANSWER 16 OF 16 HCA COPYRIGHT 2007 ACS on STN

AN 116:267165 HCA [Full-text](#)

TI Synthesis of high-temperature **superconducting** coatings and patterns by melt writing and oxidation of metallic precursor alloys

IN Gao, Wei; Vander Sande, John B.

PA Massachusetts Institute of Technology, USA

SO PCT Int. Appl., 15 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
------------	------	------	-----------------	------

-----	---	-----	-----	
-------	-----	-------	-------	--

PI	WO 9200611	A1	19920109	WO 1991-US4430 199106 21
----	------------	----	----------	--------------------------------

<--

W: CA, JP

RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, NL, SE

US 5786306	A	19980728	US 1991-696973 199105 .01
------------	---	----------	---------------------------------

<--

PRAI US 1990-542170 A 19900622 <--

AB A method for fabricating **superconducting** oxides and **superconducting** oxide composites, and for joining **superconductors** to other materials, includes applying a coating of a molten alloy contg. metallic elements of an oxide to a substrate surface, and then oxidizing the molten alloy in order to

form a **superconducting** oxide. The method further includes contacting a material to the molten alloy and then oxidizing the molten alloy, such that the material is joined to the oxidized molten alloy.

IT 111419-82-0P, Barium copper samarium oxide
(prepn. of **superconductive** coating of, by molten alloy deposition and oxidn.)

RN 111419-82-0 HCA

CN Barium copper samarium oxide (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	x	17778-80-2
Cu	x	7440-50-8
Ba	x	7440-39-3
Sm	x	7440-19-9

IT 12009-21-1, Barium zirconate
(substrate, for oxide **superconductor** coatings made from molten alloy deposition and oxidn.)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO₃) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

IC ICM H01L039-24

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 57, 75

ST oxide **superconductor** coating prepn; molten alloy deposition oxidn **superconductor**

IT Coating process
(for oxide **superconductor** prepn.)

IT Epitaxy
(of oxide **superconductor** coatings)

IT **Superconductors**
(oxide coatings, prepn. of, from molten alloy deposition and oxidn.)

IT 113390-97-9 118369-04-3 129645-32-5 131411-59-1 131411-61-5
132571-24-5 137230-30-9 140154-03-6 140154-04-7 140154-05-8
140154-06-9 140154-07-0 140154-08-1 140154-09-2 140154-10-5
140154-11-6 140154-12-7 140154-13-8 140154-14-9 140154-15-0
140154-16-1 140154-17-2 140154-18-3 140154-19-4 140154-20-7

140154-21-8 140154-22-9 140154-23-0 140154-24-1 140154-25-2
140154-26-3 140154-27-4

(deposition and oxidn. of molten, for oxide
superconductor coating prepn.)

IT 65107-47-3P, Barium copper lanthanum oxide 107539-20-8P, Barium copper yttrium oxide 108658-67-9P, Copper lanthanum strontium oxide 109457-22-9P, Barium copper dysprosium oxide 109457-23-0P, Barium copper erbium oxide 109457-24-1P, Barium copper europium oxide 109457-25-2P, Barium copper lutetium oxide 110687-33-7P, Barium copper ytterbium oxide 110687-67-7P, Barium copper gadolinium oxide **111419-82-0P**, Barium copper samarium oxide 111419-84-2P, Barium copper neodymium oxide 114901-49-4P, Barium copper ytterbium yttrium oxide 114901-61-0P, Bismuth calcium copper strontium oxide 116098-37-4P, Barium copper silver yttrium oxide 116098-54-5P, Barium copper thallium oxide 116517-51-2P, Barium calcium copper thallium oxide 116739-98-1P, Bismuth calcium copper lead strontium oxide 117944-63-5P, Barium calcium copper lead thallium oxide 120863-29-8P, Calcium copper lead strontium yttrium oxide 121891-68-7P, Copper lutetium strontium oxide 124386-52-3P, Cerium copper neodymium oxide 124386-58-9P, Bismuth copper lanthanum lead strontium oxide 125298-16-0P, Bismuth calcium copper lead silver strontium oxide 125298-27-3P, Barium copper promethium oxide 126345-78-6P, Barium copper strontium ytterbium oxide 127886-46-8P, Barium calcium copper ytterbium oxide 134854-83-4P, Cerium copper lead neodymium strontium oxide 136596-70-8P 139250-86-5P 140417-85-2P 141617-20-1P, Bismuth calcium lead strontium tin oxide
(prepn. of **superconductive** coating of, by molten alloy deposition and oxidn.)

IT 1309-48-4, Magnesium oxide, uses 1344-28-1, Alumina, uses 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-22-4, Silver, uses 7440-57-5, Gold, uses **12009-21-1**, Barium zirconate 12060-59-2, Strontium titanate 12597-68-1, Stainless steel, uses
(substrate, for oxide **superconductor** coatings made from molten alloy deposition and oxidn.)

=> D L32 1-8 BIB ABS HITSTR HITIND

L32 ANSWER 1 OF 8 HCA COPYRIGHT 2007 ACS on STN

AN 138:47879 HCA [Full-text](#)

TI High-quality RE-123 **single crystals** grown in
BaZrO3 crucible

AU Morita, Y.; Motohashi, T.; Sugihara, S.; Yamauchi, H.

CS Materials and Structures Laboratory, Tokyo Institute of Technology,

Midori-ku, Yokohama, 226-8503, Japan

SO Physica C: Superconductivity and Its Applications (Amsterdam,
Netherlands) (2002), 378-381(Pt. 1), 360-363

CODEN: PHYCE6; ISSN: 0921-4534

PB Elsevier Science B.V.

DT Journal

LA English

AB In detailed studies on the flux-pinning property of high-Tc **superconducting** copper oxides, high-quality **single crystals** are indispensable to clarify the influence of defects of different types such as the grain boundary, oxygen inhomogeneous distribution, and cation impurities. In the present study, we successfully grew high-quality RE-123 **single crystals** using **BaZrO3** crucibles and measured the magnetization of the crystals. High d. (.apprx.99%) and small grain size (<1 μm) are characteristic to the **BaZrO3** crucible as compared to crucibles of other types. With **BaZrO3** crucibles we obtained a Y-123 **single crystal** as large as 11+12+1 mm³ and a decent sized Lu-123 **single crystal** of 3+3+0.1 mm³ which had never been able to be synthesized in single phase before. To our best knowledge, this crystal is the largest one for Y-123 grown by a flux method. Crystals of typically .apprx.1.5+1.5+0.1 mm³ in size were annealed at 450 °C for 200 h in flowing O₂ gas. The crystals exhibited crit. temps. of .apprx.93.4 K and sharp transitions with $\Delta T_c < 0.8$ K. The M-T curves for the crystals exhibited significantly broadened transitions even at fields as low as H_{dblvert.c}=10 Oe. Such broadening in the transition curve reflects weak flux-pinning capability of the crystal.

IT 12009-21-1, Barium zirconate (**BaZrO3**)
(crucible; high-quality RE-123 **single crystals**
grown in **BaZrO3** crucible)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO3) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

IT 111591-03-8P, Barium copper lutetium oxide (Ba₂Cu₃LuO₇)
(high-quality RE-123 **single crystals** grown in
BaZrO3 crucible)

RN 111591-03-8 HCA

CN Barium copper lutetium oxide (Ba₂Cu₃LuO₇) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O	7	17778-80-2
Cu	3	7440-50-8
Ba	2	7440-39-3
Lu	1	7439-94-3

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 75, 77

IT Annealing

Grain boundaries

Magnetic flux pinning

Superconducting critical temperature

(high-quality RE-123 **single crystals** grown in

BaZrO3 crucible)

IT Cuprates, properties

(high-quality RE-123 **single crystals** grown in

BaZrO3 crucible)

IT 12009-21-1, Barium zirconate (**BaZrO3**)

(crucible; high-quality RE-123 **single crystals**

grown in **BaZrO3** crucible)

IT 109064-29-1P, Barium copper yttrium oxide (Ba2Cu3YO7)

111591-03-8P, Barium copper lutetium oxide (Ba2Cu3LuO7)

(high-quality RE-123 **single crystals** grown in

BaZrO3 crucible)

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 2 OF 8 HCA COPYRIGHT 2007 ACS on STN

AN 137:147879 HCA Full-text

TI Growth of high-quality RE-123 **single crystals**

using **BaZrO3** crucibles

AU Tomohashi, Teruki; Morita, Yusuke; Karppinen, Maarit; Yamauchi,

Hisao

CS Materials and Structures Lab., Tokyo Institute of Technology, Tokyo,

Japan

SO FSST News (2002), 92, 5-6, 11

CODEN: FSNEFR

PB Mito Kagaku Gijitsu Kyokai

DT Journal; General Review

LA Japanese

AB A review, including growth of Y-123 and Lu-123 **superconductor** crystals.

IT 109457-25-2, Barium copper lutetium oxide

(growth of high-quality RE-123 **single crystals**

using **BaZrO3** crucibles)

RN 109457-25-2 HCA

CN Barium copper lutetium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	x	17778-80-2

Cu		x		7440-50-8
Ba		x		7440-39-3
Lu		x		7439-94-3

IT **12009-21-1**, Barium zirconate (**BaZrO₃**)
(growth of high-quality RE-123 **single crystals**
using **BaZrO₃** crucibles)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO₃) (CA INDEX NAME)

Component		Ratio		Component
				Registry Number
=====+=====+=====				
O		3		17778-80-2
Zr		1		7440-67-7
Ba		1		7440-39-3

CC 75-0 (Crystallography and Liquid Crystals)

Section cross-reference(s): 76

IT **Superconductors**
(cuprate; growth of high-quality RE-123 **single crystals** using **BaZrO₃** crucibles)

IT Crucibles

Crystal growth

Crystal growth apparatus

(growth of high-quality RE-123 **single crystals**
using **BaZrO₃** crucibles)

IT 107539-20-8, Yttrium barium copper oxide **109457-25-2**,

Barium copper lutetium oxide

(growth of high-quality RE-123 **single crystals**
using **BaZrO₃** crucibles)

IT **12009-21-1**, Barium zirconate (**BaZrO₃**)
(growth of high-quality RE-123 **single crystals**
using **BaZrO₃** crucibles)

L32 ANSWER 3 OF 8 HCA COPYRIGHT 2007 ACS on STN

AN 134:186743 HCA Full-text

TI Effect of cation composition and oxygen nonstoichiometry on Jc-B
properties of Nd123

AU Kagiya, T.; Shimoyama, J.; Otschi, K. D.; Kishio, K.; Kitazawa,
K.; Chikumoto, N.; Murakami, M.

CS Department of Superconductivity, University of Tokyo, Tokyo,
113-8656, Japan

SO Physica C: Superconductivity and Its Applications (Amsterdam) (
2000), 341-348(Pt. 3, Materials and Mechanisms of
Superconductivity: High Temperature Superconductors VI, Part 3),

1445-1446

CODEN: PHYCE6; ISSN: 0921-4534

PB Elsevier Science B.V.

DT Journal

LA English

AB Effect of the cation compn. and O contents on flux pinning properties of Nd-123 was studied using **single crystals** grown by flux method. The obsd. secondary peak effect in Jc-B curves was largest for Nd-rich crystal (x .apprx. 0.1), and Jc systematically increased with decreasing O deficiency. These results suggested that cation substitution generates more effective pinning site than O deficiency in Nd-123.

IT **12009-21-1**, Barium zirconium oxide (**BaZrO3**)
(crucible material; effect of cation compn. and oxygen nonstoichiometry on Jc-B properties of Nd123)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO3) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

IT **111591-04-9**, Barium copper neodymium oxide (Ba2Cu3NdO7)
(effect of cation compn. and oxygen nonstoichiometry on Jc-B properties of Nd123)

RN 111591-04-9 HCA

CN Barium copper neodymium oxide (Ba2Cu3NdO7) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O	7	17778-80-2
Cu	3	7440-50-8
Ba	2	7440-39-3
Nd	1	7440-00-8

CC 76-4 (Electric Phenomena)

ST barium copper neodymium oxide **supercond** cation compn nonstoichiometry

IT Annealing

Crucibles

Crystal growth

Magnetic flux pinning

Nonstoichiometry

Superconducting critical current density

Superconducting critical temperature

(effect of cation compn. and oxygen nonstoichiometry on Jc-B properties of Nd123)

IT 1314-23-4, Zirconia, uses 1314-36-9, Yttria, uses

12009-21-1, Barium zirconium oxide (**BaZrO₃**)

64417-98-7, Yttrium zirconium oxide

(crucible material; effect of cation compn. and oxygen nonstoichiometry on Jc-B properties of Nd123)

IT **111591-04-9**, Barium copper neodymium oxide (Ba₂Cu₃NdO₇)

(effect of cation compn. and oxygen nonstoichiometry on Jc-B properties of Nd123)

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 4 OF 8 HCA COPYRIGHT 2007 ACS on STN

AN 129:338370 HCA Full-text

TI Comparative study of oxygen diffusion in rare earth

REBa₂Cu₃O_{7-δ} **single crystals** (RE=Y, Er,

Dy) with different impurity levels

AU Klaser, Marion; Kaiser, Joachim; Stock, Fredy; Muller-Vogt, German;
Erb, Andreas

CS Kristall- und Materiallabor der Fakultat für Physik, Universität
Karlsruhe, Karlsruhe, D-76128, Germany

SO Physica C: Superconductivity (Amsterdam) (**1998**), 306(3&4),
188-198

CODEN: PHYCE6; ISSN: 0921-4534

PB Elsevier Science B.V.

DT Journal

LA English

AB The authors report on measurements of the chem. diffusion coeffs. of rare earth cuprate **single crystals** REBa₂Cu₃O_{7-δ} (RE=Y, Er, Dy) grown in crucibles made of Y₂O₃-stabilized ZrO₂ and **BaZrO₃**. The diffusion coeffs. were detd. by in situ measurement of the elec. cond. using a four point method during the oxygenation at various O partial pressures and at 390-550°. In this range the diffusion coeff. was detd. between 3.7×10^{-9} cm²/s and 6.6×10^{-8} cm²/s independent of the rare earth atom or of the different impurity levels. For all crystals the in- and out-diffusion process can be described with the same time const. at each annealing temp. Within the accuracy of ±5% the authors measure for both processes the same value for the diffusion coeff. The temp. dependence of the diffusion coeff. obeys an Arrhenius-law for all crystals, proving that the O diffusion in the rare earth RE 123 **superconductors** is a purely thermally activated process. The values for the activation energy show a scattering up to 30% and vary from 0.76 to 1.09 eV. There is neither a dependence of the activation energy on the central rare earth atom nor on different impurity levels.

IT **111590-96-6D**, Barium copper dysprosium oxide (Ba₂Cu₃DyO₇),

oxygen-deficient **111590-97-7D**, Barium copper erbium oxide

(Ba₂Cu₃ErO₇), oxygen-deficient

(oxygen diffusion in rare earth barium cuprates with different
amts. of impurities)

RN 111590-96-6 HCA

CN Barium copper dysprosium oxide (Ba₂Cu₃DyO₇) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	7	17778-80-2
Cu	3	7440-50-8
Ba	2	7440-39-3
Dy	1	7429-91-6

RN 111590-97-7 HCA

CN Barium copper erbium oxide (Ba₂Cu₃ErO₇) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	7	17778-80-2
Er	1	7440-52-0
Cu	3	7440-50-8
Ba	2	7440-39-3

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 65

ST oxygen diffusion barium lanthanide cuprate **superconductor**

IT **Superconductors**

(cuprate; oxygen diffusion in rare earth barium cuprates with different amts. of impurities)

IT 7782-44-7, Oxygen, properties 109064-29-1D, Barium copper yttrium oxide (Ba₂Cu₃YO₇), oxygen-deficient **111590-96-6D**, Barium copper dysprosium oxide (Ba₂Cu₃DyO₇), oxygen-deficient **111590-97-7D**, Barium copper erbium oxide (Ba₂Cu₃ErO₇), oxygen-deficient

(oxygen diffusion in rare earth barium cuprates with different amts. of impurities)

RE.CNT 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 5 OF 8 HCA COPYRIGHT 2007 ACS on STN

AN 128:199218 HCA Full-text

TI On the origin of the so-called fishtail effect in **single crystals** of the RE - 123 compounds (RE = Y, Er, Nd)

AU Erb, Andreas; Genoud, Jean-Yves; Dhalle, Marc; Marti, Frank; Walker, Eric; Flukiger, Rene

CS Departement de Physique de la Matiere Condensee, Universite de Geneve, Geneva, 1211/4, Switz.

SO Institute of Physics Conference Series (1997), 158(Applied
Superconductivity 1997, Vol. 2), 1109-1112
CODEN: IPCSEP; ISSN: 0951-3248

PB Institute of Physics Publishing

DT Journal

LA English

AB We report on expts. performed on twinned crystals grown in the recently developed non reactive crucible material **BaZrO₃**. Due to the very high purity (5 N) the expts. are not obscured by residual impurity effects. In YBa₂Cu₃O_{7-δ} the so-called fishtail effect in the magnetization curves can be suppressed and re-established by appropriate annealing procedures with or without changing the overall oxygen content. Thus, only a locally altered distribution of the oxygen vacancies e.g. a clustering of the oxygen deficient regions must be responsible for this anomaly. For other rare earth systems addnl. complications occur due to inhomogeneities in the metal sublattice. Again, eliminating these microstructural inhomogeneities leads to the absence of the fishtail anomaly. Combining the influences of different origin on the crit. currents gives way to optimized properties.

IT 65107-47-3, Barium copper lanthanum oxide

109457-22-9, Barium copper dysprosium oxide

109457-24-1, Barium copper europium oxide

(crit. temp. for different **single crystals** in
dependence of the annealing temp.)

RN 65107-47-3 HCA

CN Barium copper lanthanum oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	x	17778-80-2
Cu	x	7440-50-8
Ba	x	7440-39-3
La	x	7439-91-0

RN 109457-22-9 HCA

CN Barium copper dysprosium oxide (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	x	17778-80-2
Cu	x	7440-50-8
Ba	x	7440-39-3
Dy	x	7429-91-6

RN 109457-24-1 HCA

CN Barium copper europium oxide (CA INDEX NAME)

Component	Ratio	Component
-----------	-------	-----------

		Registry Number
O	x	17778-80-2
Eu	x	7440-53-1
Cu	x	7440-50-8
Ba	x	7440-39-3

IT **111590-97-7D**, Barium copper erbium oxide ($\text{Ba}_2\text{Cu}_3\text{ErO}_7$), oxygen-deficient **111591-04-9D**, Barium copper neodymium oxide ($\text{Ba}_2\text{Cu}_3\text{NdO}_7$), oxygen-deficient (origin of so-called fishtail effect in magnetization curves of **single crystals** RE - 123 compds. (RE = Y, Er, Nd))

RN 111590-97-7 HCA

CN Barium copper erbium oxide ($\text{Ba}_2\text{Cu}_3\text{ErO}_7$) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O	7	17778-80-2
Er	1	7440-52-0
Cu	3	7440-50-8
Ba	2	7440-39-3

RN 111591-04-9 HCA

CN Barium copper neodymium oxide ($\text{Ba}_2\text{Cu}_3\text{NdO}_7$) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O	7	17778-80-2
Cu	3	7440-50-8
Ba	2	7440-39-3
Nd	1	7440-00-8

IT **12009-21-1**, Barium zirconate (**BaZrO₃**) (origin of so-called fishtail effect in magnetization curves of **single crystals** RE - 123 compds. (RE = Y, Er, Nd) deposited on)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO_3) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O	3	17778-80-2

Zr		1		7440-67-7
Ba		1		7440-39-3

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 77

ST cuprate **superconductor** magnetization curve fishtail effect; annealing temp cuprate **superconductor** magnetization curve; barium copper oxide rare earth substitution

IT **Superconductors**

(cuprate; origin of so-called fishtail effect in magnetization curves of **single crystals** RE - 123 compds.

(RE = Y, Er, Nd))

IT Magnetization

Superconducting critical current density

Superconducting critical temperature

(origin of so-called fishtail effect in magnetization curves of **single crystals** RE - 123 compds. (RE = Y, Er, Nd))

IT Annealing

(temp.; origin of so-called fishtail effect in magnetization curves of **single crystals** RE - 123 compds.

(RE = Y, Er, Nd))

IT **65107-47-3**, Barium copper lanthanum oxide

109457-22-9, Barium copper dysprosium oxide

109457-24-1, Barium copper europium oxide

(crit. temp. for different **single crystals** in dependence of the annealing temp.)

IT 109064-29-1D, Barium copper yttrium oxide ($\text{Ba}_2\text{Cu}_3\text{YO}_7$),

oxygen-deficient **111590-97-7D**, Barium copper erbium oxide

($\text{Ba}_2\text{Cu}_3\text{ErO}_7$), oxygen-deficient **111591-04-9D**, Barium copper

neodymium oxide ($\text{Ba}_2\text{Cu}_3\text{NdO}_7$), oxygen-deficient 203632-92-2D,

Barium copper erbium neodymium oxide ($\text{Ba}_2\text{Cu}_3\text{Er}_{0.59}\text{Nd}_{0.41}\text{O}_7$),

oxygen-deficient

(origin of so-called fishtail effect in magnetization curves of **single crystals** RE - 123 compds. (RE = Y, Er, Nd))

IT **12009-21-1**, Barium zirconate (**BaZrO₃**)

(origin of so-called fishtail effect in magnetization curves of **single crystals** RE - 123 compds. (RE = Y, Er,

Nd) deposited on)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 6 OF 8 HCA COPYRIGHT 2007 ACS on STN

AN 126:25530 HCA Full-text

TI Specific heat of **single crystalline**

PrBa₂Cu₃O_{7-δ} in magnetic fields

AU Uma, S.; Schnelle, W.; Gmelin, E.; Rangarajan, G.; Erb, A.; Walker, E.; Flueckiger, R.

CS Max-Planck Institut fur Festkoerperforschung, Stuttgart, D-70569, Germany

SO Czechoslovak Journal of Physics (1996), 46(Suppl., Pt. S5, Proceedings of the 21st International Conference on Low Temperature Physics, 1996, Part S5), 2677-2678
CODEN: CZYPAO; ISSN: 0011-4626

PB Institute of Physics, Academy of Sciences of the Czech Republic

DT Journal

LA English

AB Low temp. sp. heat studies on contamination free **single crystals** of PrBa₂Cu₃O_{7-δ} (PBCO) are reported in the temp. range 1.6-40K and in applied magnetic fields of H = 0T, 2T, 5T and 7.5 T. The measurements were performed with the applied magnetic fields parallel and perpendicular to the c-axis. The high quality of the PBCO crystals grown in **BaZrO₃** crucible is reflected in the obsd. sharp antiferromagnetic ordering peak at T_N = 16.6 K. The shift of T_N with magnetic field is found to follow a H²-dependence. The obsd. antiferromagnetic ordering of the Pr³⁺ ion is discussed in the framework of 3-dimensional ordering and compared with the previous reports on polycryst. samples.

IT **111776-14-8D**, Barium copper praseodymium oxide (Ba₂Cu₃PrO₇), oxygen-deficient

(sp. heat and antiferromagnetic ordering of **single cryst.** PrBa₂Cu₃O_{7-δ} **superconductor** in magnetic fields)

RN 111776-14-8 HCA

CN Barium copper praseodymium oxide (Ba₂Cu₃PrO₇) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	7	17778-80-2
Cu	3	7440-50-8
Ba	2	7440-39-3
Pr	1	7440-10-0

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 69, 77

ST praseodymium barium cuprate **superconductor** sp heat

IT Entropy

(magnetic; sp. heat and antiferromagnetic ordering of **single cryst.** PrBa₂Cu₃O_{7-δ} **superconductor** in magnetic fields)

IT Antiferromagnetic ordering

Heat capacity

Superconductivity

Superconductors

(sp. heat and antiferromagnetic ordering of **single**
cryst. PrBa₂Cu₃O_{7-δ} **superconductor** in
magnetic fields)

IT **111776-14-8D**, Barium copper praseodymium oxide (Ba₂Cu₃PrO₇),
oxygen-deficient
(sp. heat and antiferromagnetic ordering of **single**
cryst. PrBa₂Cu₃O_{7-δ} **superconductor** in
magnetic fields)

L32 ANSWER 7 OF 8 HCA COPYRIGHT 2007 ACS on STN

AN 124:275734 HCA Full-text

TI The use of **BaZrO₃** crucibles in crystal growth of the
high-Tc **superconductors**. Progress in crystal growth as
well as in sample quality

AU Erb, A.; Walker, E.; Flueckiger, R.

CS Departement de Physique de la Matiere Condensee, Universite de
Geneve 24, quai Ernest Ansermet, Geneva, 1211/4, Switz.

SO Physica C: Superconductivity (Amsterdam) (1996), 258(1&2),
9-20

CODEN: PHYCE6; ISSN: 0921-4534

PB Elsevier

DT Journal

LA English

AB Home-made **BaZrO₃** crucibles were used as a crucible material for soln. growth of **single crystals** of
REBa₂Cu₃O_{7-δ} (RE = Y, Er, Dy, Pr) and of Y_{1-x}Pr_xBa₂Cu₃O_{7-δ} **single crystals** (0 ≤ x ≤ 1).
This new crucible material does not react with the melts commonly used as flux. As a consequence, the
compn. of the melt is not altered during crystal growth and the impurity content in the **single crystals** is
much smaller than for crystals grown in other crucible materials. The absence of corrosion also makes
the crystal growth far more efficient; thus it was worthwhile to grow crystals using high-purity (5N)
starting materials, to further enhance their quality. The high quality of the 123 crystals grown in
BaZrO₃ crucibles is reflected in their phys. properties. As an example, the 1st observation of the flux
lattice with STM expts. on the 123 **superconductors** was performed on an uncleaved crystal grown in
BaZrO₃ without any surface conditioning, thus revealing **superconducting** behavior up to the
uppermost layer of the crystal. Another example is furnished by low-temp. sp. heat measurements:
besides a very narrow **superconducting** transition, these measurements show the absence of the upturn
usually attributed to flux inclusions and hence to magnetic ordering of the flux component BaCuO₂.
The quality of 123 **single crystals** was considerably improved by using **BaZrO₃** crucibles.

IT **12009-21-1**, Barium zirconate (**BaZrO₃**)
(properties of high-Tc **superconductors** grown using
BaZrO₃ crucibles)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO₃) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
=====+=====+=====		

O		3		17778-80-2
Zr		1		7440-67-7
Ba		1		7440-39-3

IT **111590-96-6D**, Barium copper dysprosium oxide ($\text{Ba}_2\text{Cu}_3\text{DyO}_7$), oxygen-deficient **111590-97-7D**, Barium copper erbium oxide ($\text{Ba}_2\text{Cu}_3\text{ErO}_7$), oxygen-deficient **111776-14-8D**, Barium copper praseodymium oxide ($\text{Ba}_2\text{Cu}_3\text{PrO}_7$), oxygen-deficient (properties of high-Tc **superconductors** grown using **BaZrO₃** crucibles)

RN 111590-96-6 HCA

CN Barium copper dysprosium oxide ($\text{Ba}_2\text{Cu}_3\text{DyO}_7$) (CA INDEX NAME)

Component		Ratio		Component
				Registry Number
O		7		17778-80-2
Cu		3		7440-50-8
Ba		2		7440-39-3
Dy		1		7429-91-6

RN 111590-97-7 HCA

CN Barium copper erbium oxide ($\text{Ba}_2\text{Cu}_3\text{ErO}_7$) (CA INDEX NAME)

Component		Ratio		Component
				Registry Number
O		7		17778-80-2
Er		1		7440-52-0
Cu		3		7440-50-8
Ba		2		7440-39-3

RN 111776-14-8 HCA

CN Barium copper praseodymium oxide ($\text{Ba}_2\text{Cu}_3\text{PrO}_7$) (CA INDEX NAME)

Component		Ratio		Component
				Registry Number
O		7		17778-80-2
Cu		3		7440-50-8
Ba		2		7440-39-3
Pr		1		7440-10-0

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 57, 75

ST barium zirconate crucible **superconductor** crystal growth;

rare earth cuprate **superconductor** crystal growth

IT Crucibles

Crystal growth

Heat capacity

Superconductors

(properties of high-Tc **superconductors** grown using **BaZrO₃** crucibles)

IT Cuprates

(properties of high-Tc **superconductors** grown using **BaZrO₃** crucibles)

IT **Superconductivity**

(crit. temp., properties of high-Tc **superconductors** grown using **BaZrO₃** crucibles)

IT **12009-21-1**, Barium zirconate (**BaZrO₃**)

(properties of high-Tc **superconductors** grown using **BaZrO₃** crucibles)

IT 109064-29-1D, Barium copper yttrium oxide (Ba₂Cu₃YO₇), oxygen-deficient 111147-68-3D, Barium copper praseodymium yttrium oxide (Ba₂Cu₃Pr_{0.2}Y_{0.8}O₇), oxygen-deficient **111590-96-6D**, Barium copper dysprosium oxide (Ba₂Cu₃DyO₇), oxygen-deficient **111590-97-7D**, Barium copper erbium oxide (Ba₂Cu₃ErO₇), oxygen-deficient **111776-14-8D**, Barium copper praseodymium oxide (Ba₂Cu₃PrO₇), oxygen-deficient 126941-55-7D, Barium copper praseodymium yttrium oxide (Ba₂Cu₃Pr_{0.58}Y_{0.42}O₇), oxygen-deficient 175481-42-2D, Barium copper praseodymium yttrium oxide (Ba₂Cu₃Pr_{0.67}Y_{0.33}O₇), oxygen-deficient (properties of high-Tc **superconductors** grown using **BaZrO₃** crucibles)

L32 ANSWER 8 OF 8 HCA COPYRIGHT 2007 ACS on STN

AN 123:71866 HCA [Full-text](#)

TI **BaZrO₃**: the solution for the crucible corrosion problem during the **single crystal** growth of high-Tc

superconductors REBa₂Cu₃O_{7-δ}; RE = Y, Pr

AU Erb, A.; Walker, E.; Flueckiger, R.

CS Departement de Physique de la Matiere Condensee, Universite de Geneve, 24, quai Ernest Ansermet, Geneva, 1211/4, Switz.

SO Physica C: Superconductivity (Amsterdam) (1995), 245(3&4), 245-51

CODEN: PHYCE6; ISSN: 0921-4534

PB Elsevier

DT Journal

LA English

AB The authors report on the soln. growth of **single crystals** of YBa₂Cu₃O_{7-δ} and PrBa₂Cu₃O_{7-δ} in a new type of home-made crucible, made of **BaZrO₃**, which has the advantage that it does not react with the occurring melts which are commonly used as a flux. These new crucibles have several advantages:

not only the crystals obtained after the growth expt. contain no impurities from the crucible material, but also an important problem is solved, e.g. the corrosion of the crucible does no longer change the compn. of the melt during the growth expt., thus avoiding uncontrollable growth conditions. Hence, due to this novel inert crucible material the use of more sophisticated crystal growth techniques such as top seeded soln. growth (TSSG) are now possible.

IT 12009-21-1, Barium zirconate (**BaZrO₃**)

(barium zirconate crucibles for anticorrosive growth of barium copper rare earth oxide **superconductors**)

RN 12009-21-1 HCA

CN Barium zirconium oxide (BaZrO₃) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	3	17778-80-2
Zr	1	7440-67-7
Ba	1	7440-39-3

IT 111776-14-8D, Barium copper praseodymium oxide (Ba₂Cu₃PrO₇), oxygen-deficient

(barium zirconate crucibles for anticorrosive growth of barium copper rare earth oxide **superconductors**)

RN 111776-14-8 HCA

CN Barium copper praseodymium oxide (Ba₂Cu₃PrO₇) (CA INDEX NAME)

Component	Ratio	Component
	Registry Number	
O	7	17778-80-2
Cu	3	7440-50-8
Ba	2	7440-39-3
Pr	1	7440-10-0

CC 76-4 (Electric Phenomena)

Section cross-reference(s): 57, 75

ST barium zirconate crucible cuprate **superconductor** growth

IT Crucibles

Superconductors

(barium zirconate crucibles for anticorrosive growth of barium copper rare earth oxide **superconductors**)

IT 12009-21-1, Barium zirconate (**BaZrO₃**)

(barium zirconate crucibles for anticorrosive growth of barium copper rare earth oxide **superconductors**)

IT 109064-29-1D, Barium copper yttrium oxide (Ba₂Cu₃YO₇),

oxygen-deficient 111776-14-8D, Barium copper praseodymium oxide (Ba₂Cu₃PrO₇), oxygen-deficient

(barium zirconate crucibles for anticorrosive growth of barium
copper rare earth oxide **superconductors**)